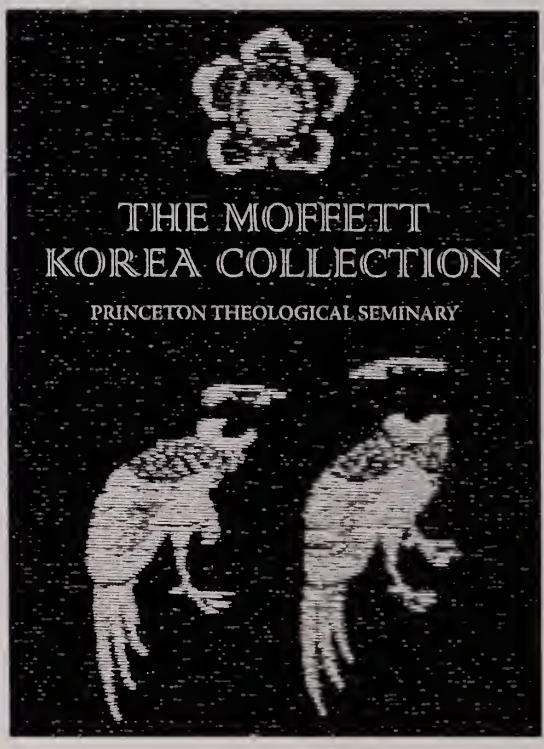
THE NATURALIST IN MANCHURIA

ARTHUR DE C. SOWERBY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Sam Moffett
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The Naturalist in Manchuria

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Sika Stag (*Cervus mandarinus*) in Chang Hsun's park at Pei-tai-ho, N. China. This species is closely related to the Manchurian Sika (*C. mantchuricus*), which it resembles in general appearance.

The Naturalist in Manchuria, By Arthur de Carle Sowerby,

F.R.G.S., F.Z.S., M.B.O.U. Author of:—"Fur and Feather in North China;" "A Sportsman's Miscellany;" "Sport and Science on the Sino-Mongolian Frontier;" and joint author with Robert Sterling Clark of "Through Shên Kan." . . .

With Photographs and Sketches by the Author.

Volumes II & III.

The Mammals and Birds of Manchuria.

. . . . . Many a thrill
Of kinship, I confess to, with the powers
Called Nature: animate, inanimate,
In parts or in the whole, there's something there,
Man-like, that somehow meets the man in me.

—*Browning.*

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This Book is
Affectionately Dedicated To My Sisters
Flora and Ada.

Introduction.

The Natural History of Manchuria.

The natural history of the wonderful region, of which present day Chinese Manchuria forms the centre, and which, for the purposes of this work, we have called the Manchurian Region, is mainly a closed book to the nature loving British and American public.

This is due to the fact that so little in the way of scientific exploration has been carried out in these parts by members of the Anglo-Saxon race for British or American institutions that the literature upon the subject in the English language, either popular or purely scientific, is comparatively small.

This does not mean, however, that the Manchurian Region has not been biologically explored. It has; but mainly by Russian and other continental scientists, notably German, working under the auspices of the late Imperial Russian Government; while the publications on the subject are nearly all in Russian or German.

By the learned and popular writings of many eminent explorers and naturalists the faunas and floras of most parts of the world have been made familiar to us. We have our classics upon the wonderful faunas of South America: the marsupial mammalia of Australia is well-known to us, as also are the great anthropoid apes and the multitude of antelopes of the dark continent of Africa. In the country-side and along the shores of our own home lands there is hardly a bird, beast, reptile, fish or lower form of animal life that has not been the subject of scientific discussion, or more popular writings.

China, that land of biological curiosities, has from time to time yielded some new and rare species of animal or plant to delight the heart of the scientist at home, and even to rouse the passing interest of the amateur and lay man; but it is only within comparatively recent times that her wealth in this direction has

begun to be appreciated: when such men as the late Malcolm P. Anderson and Frank N. Meyer, as well as Wilson, Purdom, Kingdon Ward, La Touche, Dr. J. A. C. Smith, and others, to which company the present writer, with all due humility, may claim to belong, have traversed the country from end to end, discovering large numbers of new species, and confirming by their extensive collections the existence of those already described.

Even so the knowledge of their discoveries has belonged to a limited circle of biologists rather than to that by no means small section of the general public which takes an interest in scientific progress and discoveries, but whose taste for such things can only be indulged during more or less limited hours of leisure.

Manchuria, however, has not received even this amount of attention from our workers. This country has suffered neglect at the hands of both British and American field naturalists, and even more so at the hands of the writers of popular natural history.

The causes contributing to this state of affairs are to be sought for in the political history of Manchuria and neighbouring regions. In the first place this country was the ancestral home of the late Manchu Dynasty; and the Ching Emperors, with all the pride and prejudice of true oriental potentates, resented the intrusion of hated aliens into the sacred home of their forefathers. But though they were successful in keeping out other European nationals, who sought entrance by way of China, they could not keep out the Russian invader in the north, who, having gained a foothold on the Amur and the coastal province of Primorskaya, as well as a political ascendency in Chinese Manchuria, was equally resentful of the intrusion of inquisitive travellers, particularly those of British nationality.

Even as recently as 1914 and 15, when I tried to carry out explorations in the territories under Russian rule, I was met with suspicion and unfriendliness, hampered and blocked by what appeared to be inimicable officialdom, watched and dogged by the police, and finally arrested as a spy.

Add to such official discouragement, the abominable conditions of travel and the ever present danger of lawless bands of marauders, and it is not difficult to see why naturalists and explorers, other than those under the protection of the all powerful (at that time) Russian Government, and who had the easy means of transit offered by the great rivers of the Amur system, turned

their attentions to the rich and promising fields of Japan and China instead of to the Manchurian Region.

But the Russian and German explorers already referred to kept entirely to the areas under Russian political control, that is to say, to the Amur and Primorsk provinces, and in these they seem to have kept mainly to the larger rivers. The greater part of Chinese Manchuria, particularly the forested and mountainous areas of Kirin and Heilungkiang, remained unexplored either by them or field naturalists of other nationality till within comparatively recent times, and, even so, large areas still remained unvisited in 1913, when I began the series of explorations, with the results of which this book deals.

My object in undertaking this work was to complete as far as possible our knowledge of the fauna of the Manchurian Region, and, though concerned mainly with the unexplored areas already mentioned, I hoped in time to go over the whole region. The first part of my programme was carried out fairly successfully; but the re-exploration of the Amur, Ussuri, and Primorsk regions was found impossible, owing to the political situation, which, of course, was greatly aggravated by the recent world war, the influences of which were nowhere more strongly felt than in this far eastern part of the crumbling Russian Empire.

As may have been gathered from the narrative of my travels and experiences in Manchuria, which form the subject matter of Volume I of this work, I made collections at the following places, which are arranged here in the order in which I visited them, and none of which have been visited by other naturalists or field collectors.

They are:—

1. Yu-shu-ch'a, in the forested area 20 to 35 miles S.S.E. of Ch'ao-yang Chên, which lies 150 miles to the E.N.E. of Mukden on the Kirin-Fengtien border.
2. Yen-t'ung La-tzu, near the junction of the Hui-fa Ho and Sungari River, 100 miles S.S.E. of Kirin City, Kirin Province.
3. The Yalu River, 120, 150, and 180 miles from its mouth, on both the Manchurian and Corean banks.
4. The forests round I-mien-p'o, on the Chinese Eastern Railway, between Harbin and Ninguta, North Kirin Province.

5. The Lower Sungari River, about 120 miles below Sansing, and about 30 miles from the junction of that river with the Amur, Heilungkiang Province, and near Fu-chin Hsien on the Kirin bank of the Sungari.

These, it will be seen, form a chain of collecting stations running from south to north through Central Manchuria, the very heart of the hitherto biologically unexplored region.

The specimens that I collected were sent to the United States National Museum, where most of them have been identified by experts.

But before going into details of my own work it would be well to survey that of the collectors and explorers who preceded me in the field, as well as of the experts who reported and published upon what they discovered.

One of the very earliest explorer-naturalists in the East Siberian region whose work has bearing upon our subject was G. W. Steller. He visited Kamschatka and the islands of the North Pacific, and to him we owe the only clear accounts of the life history of the great northern sea-cow, often called *Rhytina stelleri* after him. His explorations took place during the first half of the 18th century, while his "*De bestiis marinis*" and account of the sea-cow were pubished in 1751, and his work on Kamschatka in 1774.

Like that of Steller the work of Peter Simon Pallas, one of the earliest explorers of Central Asia and Siberia, from about 1770 to 1801, cannot be said to deal actually with the Manchurian fauna, though it bears upon the subject very importantly. This great traveller and observer did indeed touch the northern fringe of our region, and he reached the Okhotsk Sea not far from, if not actually at the mouth of the Amur. He described a great many species of birds, beasts, fishes, reptiles, lower animals, and plants that have since been found to occur in the Amur and Manchuria Proper.

Dr. A. T. von Middendorff was another Siberian explorer, who, about the year 1845, nearly a hundred years after Pallas, reached the Okhotsk Sea, and explored its southern coast and the neighbouring hinterland north of the Amur mouth. His work, reported upon by himself and others and published in his "*Siberische Reise*," also bears strongly upon our subject.

In the years 1854 to 1856 Dr. Leopold von Schrenck, ably supported and assisted by R. Maack, C. Maximowicz, Ditmar, Gerstorff and Voznessenski, did splendid work in what he called "Amurlande," the basin of the Amur River from its western extremity to its mouth, as well as "Ussurilande," or the valley of the Ussuri River, the South coast of the Primorsk, Saghalin Island, and even parts of Yezo, and the Kuril Islands. He published the results of his investigations in a magnificent work called "*Reisen und Forschungen im Amur-Lande, in den Jahren 1854-1856,*" but he neglected the unique opportunity presented to him of naming and describing many new species, referring, as he did, the majority of the Amur mammals, and other lower forms of animal life—since been found to be distinct—to already well-known European species.

Gustav Radde, working contemporaneously with, but independently of, Schrenck, from 1855 to 1859, in Dauria, the Amur, and Ussuri, was more enterprising in this matter, and was responsible for the naming of a number of thoroughly good species of mammals and other animals, though he, too, seems not to have realized the significance of some of the species he came across. His work, however, appears to have been more of a botanical nature, and our present knowledge of the flora of the regions he visited is largely due to his activities.

Benedikt Dybowski was another explorer-naturalist of about the same period. His work was chiefly on the reptiles and fishes of the Ussuri region and Lake Hanka, L. Taczanowski a few years later working and publishing reports upon the birds of the same region.

Pierre Mari Heude, who was not an explorer or field naturalist like any of the foregoing, but who, with the aid of residents and travellers in various parts of these and other regions, founded a very useful museum in Shanghai, China, known as the Sikawei Museum, erred seriously as regards the mammalogy of Manchuria and the Ussuri in attempting to differentiate too many species. To him, however, are due the naming of a number of perfectly good species of large mammals, such as the gigantic wild boar (*Sus gigas*), the goral (*Urotragus raddeanus*), the Manchurian grizzly, (*Spelæus cavifrons*), the brown bear of these parts (*Ursus mandchuricus*), and the black bear, (*Selenarctos ussuricus*).

My friend, and at one time co-worker, the late Malcolm P. Anderson, visited Saghalin Island in 1906, in the interests of the British Museum, having already done splendid collecting work in Japan and Corea. His mammalian specimens were reported upon, and several new species described, by Mr. Oldfield Thomas, who also described some new species from the Ussuri, as well as some from North-western Kirin, and the Khingan Mountains in Heilungkiang taken by some Japanese collectors sent there by Mr. Owston of Yokohama. The birds taken at the same time were reported upon by Mr. Collingwood Ingram.

Other naturalists who in the last few decades have worked upon the natural history of the Manchurian Region are Dr. Satunin, S. J. Ognev, Mr. N. Hollister, A. M. Nikolsky, Dr. A. J. Allen, and Mr. Gerrit S. Miller, Jr. in regard to the mammals; Dr. Stejneger, Dr. A. H. Clark, Prof. S. A. Buturlin, G. I. Poliakow, and V. K. Bianchi in regard to the birds; Dr. G. A. Boulenger, Dr. L. Stejneger, and A. M. Nikolsky in regard to the reptiles and amphibians; and Dr. L. S. Berg, and P. Schmidt in regard to the fishes.

The most important and comprehensive works on the natural history of the Manchurian Region are, with but one exception, in other than the English language. Excluding those of Pallas and Middendorff, the following five great works may be cited and summarized as forming a substantial basis for the study of our subject:—

1. *Reisen und Forschungen im Amur-Lande in den Jahren 1854-1856*, by Leopold von Schrenck. This deals with the mammals, birds, marine, land, and freshwater molluscs, insects (*Lepidoptera* and *Coleoptera*), geology, meteorology, and people of the Amur basin, including part of the Lower Sungari valley, and the Ussuri valley, Saghalin Island, and, in regard to the marine molluscs, part of Yezo. With the exception of the parts upon the *Lepidoptera* and *Coleoptera* by E. Ménétries and V. de Motschulsky, respectively, which are in French, this magnificent work is in German. In regard to the subjects it takes up it is very complete, but, as already pointed out, the names used for many species, have since been found to be incorrect, so that the work itself is somewhat out of date.

2. *Herpetology of Japan and Adjacent Territories*, by Leonard Stejneger.

   This deals very exhaustively with the reptiles and amphibians of Japan and adjacent territories, in which is included the whole of the Manchurian Region. It mentions and describes in detail every species that was tion, 1907, and, of course, summarizes all previous work known to occur in these regions up to the date of publica- upon these cold-blooded vertebrates in our region.

3. *Pisces Marium Orientalium Imperii Rossici*, by P. Schmidt.

   As its name suggests this valuable work, which is in the Russian language, deals with the fish of the Eastern Seas of the Russian Empire, in which are included the Okhotsk and Japan Seas, as well as neighbouring parts of the North-west Pacific. It gives a complete (up to 1904) list of the fish that occur off the coasts of the Amur and Primorsk Provinces, though it does not deal with the fish of the Pe-chi-li and Liao-tung Gulfs, and Corea Bay, which must be considered as belonging to the Manchurian Region. It was published in 1904.

4. *Ichthyologia Amurensis*, by L. S. Berg.

   This is a complete account of the fish of the whole Amur basin as known at the date of its publication in 1909. It, too, is in Russian.

5. *Flora Manchuriæ*, by V. L. Kamarov.

   This consists of three volumes published in the Acta Horti Petropolitini (Vol. XX, XXII, and XXV) for the years 1901-02, 1903-04, and 1905-07, in Russian, which deal exhaustively with the flora of the whole Manchurian Region. The names and distribution of the plants are in Latin, the references in the language in which they occur, so that the book is of great value to all, even those who are not familiar with Russian. It contains, also, a very valuable bibliography.

To these five comprehensive works must be added an enormous, but very scattered, literature upon our subject, mention of the items of which will be found in the bibliographies appended to each section of the present work with which they are concerned.

To understand fully the natural history of a country such as that under notice it is essential to have a clear appreciation of its

topography, climate, and the distribution of its forested and unforested areas. Those who have read the previous volume of this work will have gathered all that it is necessary to know on these points; but for the sake of those who desire only the natural history of the country, and care not to follow the wanderings of the explorer, the following short account of the physiography of the Manchurian Region has been prepared.

Manchuria is primarily a forest-meadow country. It is not many years since a great forest-belt stretched, almost without a break, from its south-eastern border westward up to and beyond the Kirin-Fengtien border, embracing the great range of mountains known as the Chang-pei Shan, south-westward down the Yalu Valley to within a comparatively short distance of its mouth, northward filling a large part of the Ussuri Valley, and in a north-westerly direction to the borders of Mongolia and Transbaikalia, embracing almost the whole of the Sungari basin, the southern part, at least, of the Little Khingan Mountains, and the northern parts of the Great Khingan Mountains, both in Heilungkiang Province, and a considerable part of the Amur basin north of that river.

These forested areas have now been considerably reduced by the influx of settlers, but they are still very extensive in Kirin Province, the Ussuri Valley, Primorskaya, as the coastal province is called, Heilungkiang, and throughout the Amur. Extensive stretches of the Sungari River, from a few miles above Kirin City to its junction with the Amur, now pass through cultivated or meadow land. The Yalu has lost much of its timber, and is now only forested about its head waters. The Ussuri has a railway and many towns and villages down the whole length of its valley.

The province of Fengtien is practically clear of forest, though the hills in the extreme east are well covered with vegetation. The rest is almost entirely under cultivation.

Three extensive mountain systems occur in Chinese Manchuria. These are the Chang-pai Shan, which stretch from east to west across Southern Kirin, tapering off in the form of hills in South-eastern Fengtien; the Little Khingan Mountains in Eastern Heilungkiang; and the Great Khingan Mountains running from North to South through Western Heilungkiang, Dauria, and Eastern Mongolia to the Chinese frontier. North of the Amur are the Bureija Mountains, which might be called a northward extension of the Little Khingan Mountains, and other ranges

which might be considered as spurs of the great east-to-west range that forms the northern rim of the Amur basin and is known as the Yablonoi and Stenavoi Mountains. Between the Ussuri and the sea is a not very high range called the Alin Shan.

Of the province of Fengtien, the western part consists of a fine, rolling, and fertile plain. The eastern and south-eastern parts, including the Liao-tung Peninsula, consist of hilly country, in places wooded, but more often bare or covered only with low vegetation and grass.

The Liao River, having its origin in Mongolia, drains the western and central areas of this province. It flows into the Liao-tung Gulf, a northern arm of the Pe-chi-li Gulf. The Yalu River rises on the southern slopes of the Old White Mountain (Lao Pai Shan), which is the highest peak of the Ch'ang-pai Shan, and, flowing in a south-westerly direction, divides South Manchuria from Corea. To its east a much smaller river, the Tumen, rises also in the Lao Pai Shan and divides North-eastern Corea from South-eastern Manchuria. The Yalu flows into Corea Bay on the west of the Corean Peninsula, and the Tumen into the Japan Sea on the east.

The Sungari River, with its tributary the Er-tao-kiang, rises on the northern slopes of the Lao Pai Shan and flows in a general northerly direction, draining the greater part of Kirin Province. Next it makes a great sweep to the west and is joined by its mighty tributary the Nonni Ho, which drains Dauria and Western Hei-lungkiang. It then turns east again, and is joined by the Mu-tan Ho, or Peone River (also called Hurka River) at San-sing. Continuing in a north-easterly direction it finally joins the Amur. The Ussuri River rises in Lake Hanka (or Chanka) in South-west Kirin, and flowing northward joins the Amur at Harborovsk. The Amur itself rises well to the west of Dauria in the Kulun and Bori Lakes. Here it is called the Argun. It is joined by the Shilka and many other rivers that drain the Amur Province as it flows first south-east, then east, and finally north-north-east, and east, emptying itself into the Tartar Straits.

Besides the lakes already mentioned there is one called Birien, or Nan-hai, on the Mu-tan Ho, and a few in the Lower Amur region. Amongst the forest clad hills and mountains of West and South Kirin are a number of small lakes occupying the craters of extinct volcanoes, or volcanic vents. Of these the largest and

most important is the Lung Wang Tan (Dragon Prince's Pool), which lies in the crater of the Lao Pai Shan, itself an extinct volcano of an altitude of about 7,000 ft. above sea level.

In its climate Manchuria is very different from North China, for whereas the latter may be described as dry, in spite of torrential summer rains, the former, except in the south and west, is decidedly humid. Throughout the spring frequent rains occur, followed in the summer by a season of very heavy down-pour. The autumn, again, is rainy; while throughout the winter heavy falls of snow are frequent.

Nevertheless, there are frequent periods of warm, bright sunshine. The spring and autumn temperatures are mild, but in summer it becomes very hot, a temperature of 95° F. in the shade being registered as far north as the Lower Sungari Valley. Winter is excessively cold, zero weather prevailing for several months. In some parts, notably the North-west Kirin plains, and the northern parts of Heilungkiang, extraordinarily low temperatures are experienced.

It will thus be seen that, except for the generally lower altitudes of the mountains, the country partakes very much of the nature of Alaska, or British Columbia, and scarcely at all of that of neighbouring North China, with which it has always been associated biologically. Indeed, the greater part of Manchuria, including in that term the Amur and Primorsk, far more closely resembles the Siberian forested and meadowed areas, which are separated from China by the howling wastes of the Gobi and East Mongolian Deserts.

Under these circumstances we might well expect to find a fauna distinct from that of North China, similar in many respects to that of Kamschatka and East Siberia generally, and through them related to that of the North-western parts of the North American continent on the one hand, and Europe on the other. And this is exactly what we do find, though it must be admitted that the fauna of Manchuria is linked up with that of China by a mingling of species, just as the two countries are linked up by a free-way along the sea coast without the intervention of any form of natural barrier.

In going through the list of the Manchurian animals, especially those of the Amur basin, one at once becomes aware of a sense of familiarity, which is explained by the fact that many European forms are met with. First in regard to the mammals

it will be found that well-known European species of bats, carnivores and rodents occur, though not so many as was given by Schrenck. Of these the hare (*Lepus timidus*), the stoat (*Mustela erminea*), the pine marten (*Martes martes*), the wolf (*Canis lupus*), the fox (*Vulpes vulpes*), the lynx (*Felis lynx*), the wolverine (*Gulo luscus*), and the bats, *Myotis daubentoni*, *Vespertilio murinus*, and *Vesperugo borealis*, may be cited as examples. Though a good many species have been separated specifically from their European relatives, these it has been found impossible to separate.

The same applies to the indigenous, or resident, bird-fauna of Manchuria, though in this case most of the forms have been separated subspecifically from their European relatives, in same cases, it must be admitted, on very slender grounds. In any case they are mostly linked up with European species by intergrading forms throughout Siberia.

The hazel grouse (*Tetrastes bonasia*) is a good example of this. Birds of this species, but of different subspecies, occur from Europe, through Siberia, to the Amur and Manchuria. The genus is not represented in North China now, though a species is to be met with in the extreme west. The black-grouse and capercaillie are two other resident birds represented in Europe and Manchuria by very closely related subspecies.

The only difference between the two representatives of the latter is the smaller bill of the eastern form, while it is difficult to find any difference between those of the former. The little Tengmalm's owl (*Cryptoglaux tengmalmi*) is another bird that shows extraordinarily little difference in these two extreme areas of its range; while the long-eared owl (*Asio otus*) and the short-eared owl (*A. flammeus*) of the two areas are not even subspecifically separable.

Other birds that bear out this affinity between the Amur and Europe are most of the members of the family *Corvidæ*, many of the finches, the hawks and falcons, the gulls, terns, and other sea birds, and above all the numerous members of the duck family, most of those that visit our region, or pass through it during migration, being identical in every way with British representatives. The ducks and other migratory species cannot, however, be considered either as belonging to Manchuria, or as being fair examples of the case of relationship under discussion.

Turning to the cold-blooded vertebrates we meet with a similar distribution. The viviparous lizard (*Lacerta vivipara*), the common viper (*Coluber berus*) and the common frog (*Rana temporaria*) range from Great Britain across Europe and Siberia to the Amur and Saghalin Island. Specimens taken in the last named area are absolutely inseparable from those of England. Again there exists a most remarkable relationship between the fishes of the Amur basin and those of Europe. As examples we may cite the salmonoid genus *Hucho*, which has a distribution extending from the Amur to the Black Sea and the Danube, and, still more remarkable, the genus of sturgeon known as *Huso*, which occurs only in the Amur basin and certain parts of the Caspian basin. Other species of fish that occur in both the Manchurian Region and Europe are the common carp (*Cyprinus carpio*), the common gudgeon (*Gobio g. gobio*), the minnow (*Phoxinus p. phoxinus*), the spinous loach (*Cobitis tænia*), the burbot (*Lota lota*), the lampreys (*Lampetra fluviatilis* and *L. planeri*), and so on. Many European species are represented in these regions by subspecific forms.

In the lower forms of animal life, such as the land and fresh-water molluscs and insects, we find a still closer relationship between the Manchurian and European faunas. In regard to the former Schrenck showed that of the 55 species he listed as occurring in the Amur region, no less than 37 were European as well, only 10 being peculiar to the Amur, and 8 occurring also in China. Some of the 37 species have since been found specifically or subspecifically distinct, but even so the Manchurian fauna in this respect remains overwhelmingly European in its affinities.

The faunal relationships that exists between North America and Manchuria are mainly those of one part of the Holarctic region with another.

For instance, the well known Kamschatkan wild sheep (*Ovis nivicola*), though not inhabiting Chinese Manchuria, belongs to the general region. It is distinctly smaller than the giants of Siberia, Mongolia, North China, and Thibet of the *O. ammon* type, and forms a connecting link between these and the Alaskan and Rocky Mountain wild sheeps of the *O. montana* group. I should not mention this genus were it not for the fact that another, and, as far as I can make out, an as yet undescribed species of sheep occurs apparently actually within the boundaries of Manchuria.

I refer to a species, which I have been assured occurs in the region of Hai-lar in the west of Heilungkiang Province, and a specimen of which I saw at Harbin. This, too, is a small sheep, distinct from the Kamschatkan form on the one hand, and the Mongolian and North China forms on the other.

The Manchurian grizzly (*Spelœus cavifrons*) is an animal of peculiar interest, for not only does it form a connecting link between the Manchurian and North American faunas, but it links up the North American grizzlies with the prehistoric cave bears and grizzlies of the Pyrenees and Europe generally. Its skull is very like that of *Spelœus spelœus*.

Of the birds of Manchuria that show a relationship to those of North America the number is not so great. It is chiefly noticeable in the marine birds and birds-of-passage, or shore birds. Of purely resident forms the genus *Tetrastes* is represented in North America by the genus *Bonasa*, the ruff-grouse, a bird much like the hazel-grouse. The willow ptarmigan (*Lagopus lagopus*) is represented by the same form in both areas. The owls and hawks of both areas also show close affinities.

As regards the relationship that exists between the faunas of the Manchurian Region and neighbouring North China, what strikes one most is that certain Chinese forms have invaded Manchuria, though in certain branches of animal life there exists a distinct affinity between the two countries. Chiefly is this the case with the rodents, in which we have the genera *Mus*, *Epimys* (or *Rattus*), *Apodemus*, *Cricetulus*, *Craseomys*, *Microtus*, *Myospalax*, *Citellus*, *Eutamias*, *Sciurus*, and *Sciuropterus* represented in both regions by very closely allied species, or subspecies, or even by identical forms. It may be noted that the differences between the Manchurian and Chinese forms are mainly an increase in size and a darkening or intensification of colouring in the former.

With the ungulates the increase in size is more apparent than the intensification of colouring, the chief examples being the roe (*Capreolus mantchuricus*), the goral (*Urotragus raddeanus*), and the wild pig (*Sus gigas*). Of these it will be realized at once that the goral is not a Siberian animal, but belongs more to the Chinese and Thibetan faunas. Another such animal is the black bear (*Selenarctos ussuricus*) which is of the Himalayan black bear type.

Once more, surveying the fishes of Manchuria we note such typically Chinese species as the serpent-head (*Ophiocephalus argus*,

Cantor), the Chinese perch (*Siniperca chuatsi*, Basil), and the peculiar cyprinid, *Hypophthalmichthys molitrix*, Cuv. and Val., occurring actually within the Amur basin side by side with many species that do not occur either in, or even near the borders of, China. Nor do these Chinese species extend beyond the Amur basin into Siberia.

Not only is the Manchurian fauna related to those of China, Siberia, North America, and Europe, but also to that of Japan by way of Saghalin Island and the Corean Peninsula. There the relationship, amongst mammals, is chiefly in the bears, weasels, bats and shrews, though there is also a distinct similarity between the rodents of the two countries. In one group or genus of crustaceans Manchuria and Japan are specially related. This is the peculiar fresh-water crayfish *Cambaroides*, which is represented only in the Amur and Sungari basins and Japan, and which differs markedly from the European and North-west American *Astacus*, being nearer the North-east American *Cambarus*. The reptiles of Japan and Manchuria are also closely related.

The significance of all these facts of distribution is that the Manchurian Region—that is, Chinese Manchuria + the Amur + Primorskaya—so far from representing a distinct faunal sub-region of the Palœarctic region, as suggested by Sclater, is in fact a meeting and mixing ground of a number of other faunal sub-regions.

The reason for this intermingling of different faunas appears to lie in the fact that Manchuria lay in the path by which such forms as the goral, the black bear, the wild pig and other Asiatic or even European animals reached the Japanese Islands, and the bears, deer, and many other forms of animals, past and present, spread from Asia into North America, or from North America into Asia.

This introduces us to a very wide subject indeed, and we can only touch upon it here. It is generally accepted now that a very extensive migration of animals took place, previous to Pleistocene times, between the Old and the New Worlds by way of the land-bridge, usually called the "Miocene-Bridge," that connected North-eastern Asia with North-western America, across what is now the Bering Sea and the northern part of the North Pacific Ocean. This land-bridge must have lasted from late Jusassic through Cretaceous, Eocene, Oligocene, and Miocene times to the Pleistocene, some time in the earlier part of which it broke down

and became submerged. Migrations of whole groups of animals took place: the camels, for instance, which originated in North America, used this route to enter Asia; while the bears entered north America from Europe, *via* Asia, by the same means.

It is only natural to suppose that with such a movement of species and groups going on, some forms would be left *en route*, settling down in suitable areas, and that a country, such as Manchuria must have been even in those remote epochs, would receive fragments of a great many different groups, especially during the various advances of the polar ice-cap during the glacial epochs. This is almost certainly how the grizzly, *Spelæus cavifrons*, came to occupy Manchuria, to cite but one instance.

Not only did our region lie in the path of the great spread of land animals, man amongst them, from Europe to North America in pre-Pleistocene times, but it appears also to have been the country by which many more recent animals, or more recently spreading animals, entered China from Europe and Siberia.

The largest desert-belt of the Old World is that which stretches from North-west Africa right across that continent, through Arabia to Turkestan, north of Thibet to Mongolia, where, as the Gobi, it extends eastward to the very borders of Manchuria, invading the Amur basin, and almost reaching the Pacific Ocean. The Amur stops it; though north of the Pei-chi-li Gulf it is not many miles between the arid borders of Mongolia—where such desert forms as the little jerboa, *Dipus halli*, Sowerby, thrive—and the sea.

How long this desert belt has existed in its present continuous and unbroken form is not certain, but to-day it divides the faunas of the land masses of the Old World into two large groups, and it is only in North China, where communication by way of Manchuria has taken place, that we find any very close affinities between the faunas to the south and north of it.

As an example Mr. Hans Gadow's reference to the distribution of the Old World newts may be quoted. "In the Old World the southern progress of newts has been barred by the great belt of deserts and the Mediterranean, there being none in Africa and India, but many in China, whence at least one has extended into Siam and Burmah. The oldest Urodela occur in the Belgian Wealden, related to the American mud eel, *Amphiuma*."*

* The Wanderings of Animals, p. 96, 1913: Camb. Un. Press.

As amphibians of this group occur all the way from Europe, through Siberia, into the Amur basin and Manchuria, which is connected with China by a narrow strip of non-desert land along the sea coast, it is evident that the present day Chinese forms acquired their present distribution by following this route.

A mammal that has acquired a very similar distribution, though without spreading further south than North China, is the roedeer. Its range extends from Western Europe through North Central Asia and Siberia to Manchuria, thence into North China and on to Thibet, where it ends. Only in North China and Eastern Thibet does it occur south of the Desert-belt. The roedeer of the Thian Shan, Sungaria, and Northern Mongolia, are separated from those of North-western Kansu and North Shansi by a wide stretch of desert, which it is highly improbable that such deer could at any time have crossed.

Many more similar examples could be cited, but these will suffice to show the important part the Manchurian Region has played in the distribution of East Asiatic animals.

As has already been indicated, this influx of animals from Europe, *via* Siberia, into China, has been met by another stream moving from China north-eastward into Siberia and Japan. The carp (*Cyprinus carpio*) may be cited as an example of an animal that has spread from China, *via* Siberia, to Europe. The woolly tiger (*Felis tigris longipilis*), the spotted deer (*Sika*), and the black bear (*Selenarctos ussuricus*) may be mentioned as animals that have spread, or are spreading, from China and India into Siberia.

Since, then, the Manchurian Region is a meeting ground of several different faunal sub-regions, and as in dealing with the animal life of that country it will be necessary to make comparisons with that of other neighbouring countries, it seems advisable, in order to give the reader a clear view of the subject, to define the various East Asiatic faunal subregions as they exist to-day.

But before doing so I wish to make it perfectly clear that these faunal sub-regions are only for the present time, and have nothing whatever to do with the past distribution of any of the species to be studied. That were a subject altogether outside the scope of this work.

I am fully aware that faunal sub-regions are liable to be not only extremely artificial, but, if applied to too many different forms, extremely faulty, and that if the division of the earth into such sub-regions is to be carried out really satisfactorily, each group of animals, often each individual genus or species, would have to be dealt with separately, not only in regard to its distribution at the present time, but age by age throughout geological times.

Nevertheless, when we have, as in the present instance, a case of a desert and steppe area, coming into contact with a fertile grassland area, as well as a semi-arid hilly or mountainous area, and a very humid forest area, we are not likely to be very much at fault in making out a number of faunal sub-regions.

It will be granted at once that very often the political boundaries of a country do not coincide with the natural ones. This is very much the case with Manchuria. Man refuses to be hemmed in by the natural barriers that mark the limit of range of many animals. Thus in a given country we may have a forest fauna, a barren-land fauna, an alpine fauna, or a lowland or plains fauna—according to the nature of its physiographical features—each occupying its own sphere without very much overlapping.

At times, however, the stress of circumstances and the pressure of other species forces certain forms to cross the natural boundaries, and to invade and occupy with success other less congenial areas. It is this fact that constitutes the naturalist's greatest difficulty in determining the limits of the main faunal sub-regions in the area he is studying. Nevertheless, the task is not an impossible one, and is greatly facilitated by an accurate knowledge of the geography, configuration, vegetation, and climatic conditions of that region.

Commencing with the extreme north of Eastern Asia we find truly arctic conditions, where the tundras of Northern Siberia support a very meagre indigenous, or resident, fauna. For several months the arctic night holds sway, and scarcely a living thing can survive it. There are no trees in these northerly latitudes. A short and somewhat warm summer of perpetual day sees the advent of the birds-of-passage, many species of wild-fowl, and a certain number of passerines, who come to breed. The air rings with their myriad cries, the lakes and lagoons, swamps and marshes, peat-beds and heaths swarm with their nests—such as they are—and

later with their young. A few marauding mammals occur, such as the arctic fox, but the true mammalia of these regions is a marine, or semi-marine one, characterized by the polar bear, the walrus, seals, and some of the *Cetaceæ*. This area many be called the Arctic Faunal Sub-region.

Further south, where the forests and wide meadow-land of Siberia begin, we have what may be called the Siberian Faunal Sub-region. This extends into Kamschatka, the Amur, Primorskaya, North-eastern Corea, and embraces North Central, and East Manchuria, as well as Northern and North-western Mongolia. Spreading westward it extends into Europe, but in a south-westerly direction it is gradually lost in the treeless steppes of Central Asia. Its southern boundary line in Eastern Asia is where the forests and grasslands of Northern Mongolia meet the desert sands of the Gobi. This faunal sub-region is characterized by the red-deer or wapiti, the roedeer, the musk-deer, the moose, the reindeer, the wild pig, the brown bear, the wolverine, the ermine, the wolf, the fox, the water vole, the variable hare, the hazel grouse, the black-cock, the great black woodpecker, the Siberian jay, the common viper, the viviparous lizard, the common frog, and a great many more birds, beasts, and other forms of animal life.

Next comes what may be called the Mongolia Faunal Sub-region. This corresponds roughly with the Gobi Desert, Chinese Turkestan, and other Central Asian desert areas. Eastward it just overlaps the Manchurian political boundary, reaching to within a few miles of Harbin in North-western Kirin, and taking in a section of South-western Heilungkiang about the valley of the Nonni, and Dauria. To the south it merges into what are known as the grasslands, or T'sao-ti, of Southern Mongolia, though an arm of it extends as the Ordos Desert into China itself, and influences the faunas of Kansu, North Shensi, and West Shansi, provinces of that country. It is very easy to distinguish this desert fauna, though many of its animals are steppe and grassland inhabiting as well. The wild ass, the wild horse, the antelopes or gazelles, the manul cat, the corsac fox, a wolf, the alactagas and three-toed jerboas, the desert hamsters (*Phodopus*), the camel (two-humped), the brown snake (*Elaphe dione*), the toad-headed lizard (*Phrynocephalus frontalis*), Pallas' sand-grouse, the Mongolian lark, and so on. All the species that belong to it are more or less tawny or sandy in their colouration.

South of the Mongolian Sub-region we have the North China one. This lies to the north of the great Tsing-ling divide, which extends roughly from the Thibetan border of North Ssuchuan, or South Kansu, eastward through South Shensi into Honan, where it is lost. But it forms a very effective barrier between the North and Central Chinese faunas; though to the east of it there is a mixing of species by way of the plains of Shantung and Chihli. The North China Faunal Sub-region is represented by the large sika deer of the *Cervus mandarinus* type, the thick coated leopard (*Felis fontanieri*), the gorals, David's squirrel (*Sciurotamias davidianus*). the molerats (*Myospalax*), the hamsters (*Cricetulus*), many forms of pika or mountain hare (*Ochotona*), Radde's toad (*Bufo raddei*), and many other forms. It is distinct from the Central China Sub-region in the presence of the roedeer and the absence of the muntjac and porcupine, as well as in many differences in the birds and reptiles. This faunal sub-region overlaps the Manchurian political boundary in the north-east, occupying the west, south-west and south of Fengtien Province.

We next have the island fauna of Saghalin, the Kurils, and the Japanese Islands, which may be called the Japanese Faunal Sub-region. To this Corea belongs in part, though the fauna of that peninsula is related also to that of North China, and in the extreme north-east to that of Siberia.

Thus it will be seen that there is no such thing as a Manchurian faunal sub-region, but that different parts of the Manchurian Region must be assigned to different neighbouring sub-regions.

Following is a summary of the faunal sub-regions, of which cognizance must be taken in dealing with the animals of the Manchurian Region:—

1. Arctic faunal sub-region: Northern and North-eastern coasts and tundras of Siberia.
2. Siberian faunal sub-region: Middle and Southern Siberia. Northern Mongolia, the Amur basin, Primorskaya, Heilunkiang, Kirin, the Ussuri Valley, and North-east Corea.
3. Mongolian faunal sub-region: Gobi Desert, East Mongolia, Western Manchuria, the Ordos Desert, Chinese Turkestan, and the Central Asian Deserts.
4. North China faunal sub-region: Grasslands of South Mongolia, Kansu, North Shensi, Shansi, Honan, Chihli,

Shantung, Liao River basin in Fengtien, South-western and Southern Manchuria, and probably North-western Corea.

5. Thibetan faunal sub-region: Thibet and West Chinese highlands.
6. Japanese faunal sub-region: Saghalin, Kurils, the Japanese Islands and probably Southern Corea.

In none of these can the boundaries be sharply defined; while it will be found that in many cases a single species occurs in several of them, but on the whole they will be found to represent fairly satisfactorily areas in which certain characteristics, or characteristic forms prevail.

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VOLUME II.

MAMMALS.

PREFACE.

The Mammals of Manchuria.

As will have been gathered from remarks in the foregoing introduction to the Natural History of the Manchurian Region, the mammalian fauna of the latter will, on the whole, be familiar to the British, and, to a less extent, to the American, nature lover.

The reader need not expect to find such extraordinary animals as the elaphure, or David's deer (*Elaphurus davidianus*), or the takin (*Budorcas*), or the great panda (*Æluropus*), which have rendered the faunas of China and Thibet so unique, though the occurrence of the goral and tiger in such northerly regions is, to say the least of it, somewhat remarkable.

The Manchurian *Mammalia* is composed mainly of such familiar forms as the wapiti, or Asiatic red-deer, the roe, the bear the wolf, the fox, the badger, the otter, the ermine, the weasel, martens, the grey or fur-squirrel, various rats, mice, and voles, hares, the hedgehog, shrews, moles, and many northern forms of bat. But, as shown above, it contains a sprinkling of forms not usually looked upon as purely palœarctic, or perhaps it would be better to say that savour rather of Indo-Chinese regions. It may thus be looked upon as one of more than usual interest, though it must be admitted that it is not of very great richness in the number of species it contains. The favourable conditions that prevail over the greater part of Manchuria are conducive to a great abundance of individuals, but the general uniformity of those conditions over wide areas, as well as the lack of any very great variations in altitude throughout the whole region, have militated against any very great differentiation of species, as, for instance, has undoubtedly taken place in neighbouring North China.

Altogether, including the desert inhabiting forms of the west, and those invading the south-west and south from North China,

as well as those of Saghalin, there are not more than a little over a hundred species and subspecies of mammals in the Manchurian Region. This also includes the marine forms, such as the seals and whales, that occur in the seas that wash the Manchurian coasts.

The following eight orders are represented:—
Chiroptera by nine species.
Insectivora by nine species.
Carnivora by twenty nine species.
Pinnipedia by nine species.
Cetacea by eight (or more) species.
Ungulata by twelve species.
Sirenia by one extinct species.
Rodentia by thirty one species and subspecies
Lagomorpha by four (or more) species.

Of the hundred and twelve forms of mammal dealt with in this book only two can be claimed as new discoveries by the writer, who, as already explained elsewhere, made collections of these animals in various parts of Manchuria. These are a woodmouse, *Apodemus praetor*, described by Mr. Gerrit S. Miller, Jr. in 1914, and a bat, *Murina huttoni fuscus*, recently described by the author in the Journal of Mammalogy. Most of the forms described in the the following pages have been actually taken by the writer in Manchuria.

It is probable that other species, as yet unrecorded, occur in our region. Such may be the case with the little three-toed jerboa (*Dipus halli*, Sow.) which was recently described by the author from the Chih-feng district on the Chinese-Mongolian frontier not far from the south-western border of Manchuria. Its range probably extends into Western Manchuria along with the alactaga, (*Alactaga mongolica*), which Radde described from Dauria.

It is also possible, if not probable, that some form, or forms, of lemming occur in the northern areas of our region.

The following list of mammals is compiled from these collections made by the author and from various other sources, notably from the publications of Dr. Leopold von Schrenck, Gustav Radde, Captain Scammon and E. D. Cope, and, more

recently, Mr. Oldfield Thomas, and Mr. S. J. Ognev, and it may be taken as being as accurate as present knowledge of the subject permits.

The writer's thanks are tendered to Mr. Miller and Mr. Ned Hollister for determining the species of the specimens collected, and to Mr. Oldfield Thomas of the British Museum, and his able assistant Mr. M. A. C. Hinton for their unfailing courtesy and ready assistance whenever they were needed. This opportunity may be taken to pay special tribute to Mr. Thomas' work upon the *Mammalia* of Eastern Asia, as well as to that of the writer's friend, and at one time colleague, the late Mr. Malcolm P. Anderson, who, as a field collector, was second to none, and who by his untiring energy provided Mr. Thomas with the splendid collections from which the latter has been able to name and describe so many new species from Japan, Saghalin Island, Corea, Inner Mongolia and China.

In dealing with the Manchurian mammals in this book, a popular name has been ascribed to each species, as well as the most up to date classical name; while the reference to the original description is also added. No attempt at providing a synonomy has been made.

My special thanks are due to Mrs. Doris Murphy for assistance in proof reading and indexing this volume.

A. de C. Sowerby.

CHAPTER I.

The Bats of the Manchurian Region.

CHAPTER I.

The Bats of the Manchurian Region.

Order CHIROPTERA.

The first order of *Mammalia* that we have to consider is that of the bats, or *Chiroptera*, those little finger-winged creatures that have so much of mystery about them.

There are many problems about the life-histories of the bats that have not yet been solved satisfactorily. There is much doubt, for instance, as to what becomes of them in winter. Do they hibernate in our northern climes, or do they migrate at the approach of winter from these colder regions where in summer they are so plentiful? There is evidence to show that some, at least, of the many forms that occur in north-temperate regions, such as Manchuria and North China, remain throughout the severe winter, to which these countries are subject, but it is equally evident, and I am fully convinced, that many, if not the majority, of species and even individuals migrate, though how far they go and to what countries remains to be ascertained. It is obvious that such questions cannot be answered in full till large series of specimens have been collected in all parts of Eastern Asia at all seasons of the year; but from what we already know it is possible to form some idea as to how they will eventually be answered, and no opportunity should be lost to record facts bearing, however remotely, upon this interesting problem.

Another question which arises in connection with the study of bats is the means by which they detect the presence of their prey, hunting as they often do in the dark. Do they take the insects upon which they feed by sight, sound, or scent, or have they a sixth sense by which they detect the presence of an object without seeing, hearing, smelling or touching it To judge from their poorly developed eyes their sight must be far inferior to that of the night-flying birds, and, indeed, to that of most nocturnal mammals; but their hearing is undoubtedly extremely acute, if

the development of the external ear is anything by which to judge: while the width and size of their nasal cavities is such as to suggest a keen sense of smell. Nevertheless, one cannot help feeling that these senses alone, however keen they may be, are not sufficient to account for the absolute accuracy with which bats move about, pitch on to some slight projection from a wall or cliff, or seize the minute night-flying insects upon which they feed. This leads us to speculate upon the function of the wonderful membranous growth that some bats have upon their faces. Is it a sense organ, and if so why have not all bats got it? One is almost inclined to believe that this delicate and apparently sensitive membranous tissue is capabable of receiving impressions of some sort, about which the human being knows nothing.

Then the thought of the very kinship, so to speak, between man and bats suggests another problem. At what stage in the history of our evolution did the bats branch off from the main stem, and commence to follow the line of development that led them to the wonderful state of perfection in flight they now enjoy? Here we must look to the palœontologist for an answer, and doubtless in time shall receive it, just as in time the mammalogist by the steady accumulation of facts will be able to answer the other questions and problems already raised.

Meanwhile, let us leave the realm of speculation and turn to investigate such facts as we have within our reach concerning the bats of our region, which, after all, may prove more profitable than propounding problems which we cannot as yet answer.

The bats of the Manchurian Region are not as well known as are the other branches of *Mammalia* represented in the country, and though we may safely say that some nine species and subspecies occur there, it is almost certain that our list is not complete. For instance a number of forms have been recorded from the Peking area of Chihli, and it is extremely likely that they also occur in South-western Manchuria at least, though up to the present there are no records of this. These are the Japanese horseshoe bat (*Rhinolophus ferrum-equinum nippon*), the Chinese representative of Schreibers' bat (*Miniopterus schreibersi chinensis*) and the Peking myotis (*Myotis pequinius*). It is also probable that some form of serotine (*Eptesicus serotinus*) occurs at least in South Manchuria.

On the other hand some of the records we already have are doubtful: especially is this the case with those of Leopold von Schrenck, who gave the names of European species to many of the mammals he recorded, most of which have since been found to be distinct. Schrenck recorded the following four forms: *Vespertilio mystacinus*, Leisl., *Vespertilio daubentonii*, Leisl., *Vesperugo* (*Vesperus*) *borealis*, Nilss., and *Plecotus auritus*, L., all from the Amur region.

Mr. Oldfield Thomas records *Myotis mystacinus* from Saghalin Island, and *Vespertilio murinus* from Northern Kirin; while S. J. Ognev, a Russian naturalist, describes *Murina ussuriensis*, and *Myotis ikonnikovi*, and records *Murina hilgendarfi*, *Vespertilio murinus*, and *Plecotus auritus sacrimontis* from the Ussuri region.

In the course of my explorations I secured specimens of three different forms, which have been referred to *Myotis ikonnikovi*, *Vespertilio murinus*, and a form of *Murina* related to *M. huttoni* of India, and which I have described under the name *M. huttoni fuscus*. Recently Mr. Thomas has described *Tadarida latouchei* from Chin-wang Tao, close to the south-western border of Manchuria, where Mr. J. D. de La Touche secured the only two known specimens of this interesting species.

In the following list of bats, with descriptions and remarks, I am giving my reasons for including each form as I come to it, so need not do so here.

Family VESPERTILIONIDÆ.

All the bats hitherto recorded from Manchuria belong to the family *Vespertilionidæ*, or typical bats.

1. USSURIAN MOUSE-EARED BAT.

Myotis ikonnikovi, Ognev.

Myotis ikonnikovi, Oknev, Ann. Mus. Zool. Acad. Imp. Sci. St. Pétersbourg, Vol. XVI, pp. 475-511 (1911) 1912.

The type locality of this pretty little bat is Evseevka, near Lake Hanka, in the Imanski District of the Primorsk, and it would appear to be Schrenck's *Vespertilio mystacinus* and Thomas' *Myotis mystacinus*, Ognev having separated it from the European form. My discovery of this species in North Kirin was a matter of some importance, for Mr. Miller, to whom I sent a specimen, wrote me on receiving it that he had been in doubt as to the distinctness of that form from the European *M. mystacinus*, but that my specimen established its genuineness beyond a doubt.

It seems probable that this is the form that occupies these regions and not *M. mystacinus*, for which reason the latter is left out of our list.

Our present species agrees in size with its European congener. The head and body together measure not mort than 50 mm. It is of a sooty-brown colour above, lighter below. There is no nose-leaf, the face being plain.

It frequents the open glades in the forested area, as well as the river and stream sides in the open country, where it feeds upon the flies, mosquitoes and gnats that abound. It is probably a migratory species.

It was while camped in the swamps near Samafalo, (I-mien-p'o District) that I secured the specimens referred to above. The little animals used to hover about over my companion's and my heads at night, evidently attracted by the mosquitoes that swarmed about us. These were the only specimens I secured, but I am certain that some of the smaller bats I saw in other areas belonged to this species. It is probably fairly common throughout Manchuria.

2. Daubenton's Bat.

Myotis daubentoni, (Leisl.)

Vespertilio daubentonii, Leisl., Kuhl., Deuts. Flederm: Ann. Wett. Ges. Naturk., 1899, p. 51.

This species of bat was recorded by Schrenck from the Amur, and so may be included in the *Mammalia* of the Manchurian Region. I am unaware of its having been recorded by any other observer in these parts.

Daubenton's bat is commonly to be found hovering over water, where, apparently, it seeks its food.

It has the upper parts smoky-brown, under parts lighter, and lacks the long hairs on the face of *M. mystacinus*. It is a small species like the foregoing.

3. Mouse-like Vespertilio.

Vespertilio murinus Schreb.

Vespertilio murinus Schreb, Saüg., I, 1775, p. 165, pl. LI.

I secured a specimen of this bat at the shore farm (Oakwood Farm), near Fu-chin Hsien on the Lower Sungari River. Thomas recorded it from the Ch'ang Ch'un area to the south and west of

this point in North Kirin in 1909 (*Ann. Mag. Nat. Hist., ser. 8. Vol. 4. p. 500 Dec. 1909.*), remarking at the time that his specimen was small like the European form, and not large like the Chinese form *V. m. superans* Thos. Bearing upon this point, I have a letter in which Mr. Miller says that some specimens which I sent him from Tientsin (Chihli, N. China) are nearer the European form than the subspecies *superans*, which was described from Kuatun in Fukien (S. E. China). The main characteristic that separates *V. m. superans* from the European *V. murinus* is its greater size. In colour the two are identical. My Tientsin specimens, however, as Mr. Miller notices, are darker below than in any specimens of the European form in the Smithsonian Institution collections. Also they are intermediate in the length of the forearm between *murinus* and *superans*. My specimen from Manchuria was found to be identical with true *murinus*. Thus it would seem that there are three forms in Eastern Asia, namely, the European form, *V. murinus*, occupying the Manchurian Region, the Kuatun form, *V. m. superans*, occupying Southeastern China, and a hitherto unnamed intermediate form occupying North China. This would suggest that these species and subspecies are non-migratory, and in support of this I may state that I have secured specimens in Tientsin in mid-winter, that were sheltering in the eaves and roofs of houses. Again there is no doubt that at least one species of bat spends the winter in Manchuria, often living in the dwellings of the local human inhabitants, and I am inclined to the belief that it is *Vespertilio* that thus shelters with man.

Like *Myotis* this species has no nose-leaf or any membranous growth about the face. It is lighter in colour than the latter, and is also considerably larger.

4. Northern Vesperugo.

Vesperugo borealis, Nilss.

Vesperugo borealis, Nilss. Illum. Fig. Scaudi. Faun., 1838, häft 19, pl. 36.

Schrenck recorded this well known European form from the Amur region, but so far as I know it has been recorded by no other traveller in, or writer upon, these parts.

5. Ussurian Murina.

Murina ussuriensis, Ognev.

Murina ussuriensis, Ognev "Bemerkengen über die Chiroptera und Insectivora des Ussuri-Landes," Ann. Mus. Zool. Acad. Imp. Sci. St. Péters., Vol. XVIII, pp. 401-418, Dec. 1913. (Russian text).

This is a small form of *Murina* described by Ognev from the Ussuri region. He gives the length of its head and body as 37 mm., and that of its tail as 29 mm. From his illustration it would appear to be simply a smaller form of our next species *M. hilgendorfi*, which has also been recorded from the same region.

Ognev first reported it as some subspecies of Milne-Edwards' *M. leucogaster*, subsequently describing it as a distinct species. It has no sagittal crest on the skull.

It has recently been recorded from Yakushima, a South Japanese island, which suggests that this species is migratory.

6. Japanese Murina.

Murina hilgendorfi, Peters.

Murina hilgendorfi, Peters, Monatsbericht der Königl. Akad. der Wisseusch. zu Berlin, Jan. 1880. pp. 24-25 (Jeddo).

This *Murina*, which was originally described from Jeddo (Yedo) in Japan, has been recorded by S. J. Ognev* from the Ussuri region. It is a fairly large form, with a proportionately rather long tail. Ognev gives the following measurement:—head and body 50 mm.; tail 40-6 mm. There is a low sagittal crest on the skull.

It is interesting to find this species on the mainland, since it suggests migration. Indeed, from other records than this it would appear that migration takes place between the Japanese Islands and the mainland. Allen says of a Japanese specimen that the fur is thick and woolly, bright brownish above, tipped grey-white with dark bases below.

7. Dusky Murina.

Murina huttoni fuscus, Sowerby.

Murina huttoni fuscus, Sowerby, Journal of Mammology, Vol. 3, No. 1. February, 1922, pp. 46-7.

The single specimen that I obtained of this peculiar looking bat, appears, on examination, to be different from any known form of *Murina*, though belonging to this genus; but up till recently it

*Ann. Mus. Zool Acad. Imp. Sci. St. Péters., Vol. XVIII, pp. 401-419, pl. XII. 1913.

remained undescribed, owing to lack of material with which to compare it, and the generally unsatisfactory state of the group to which it belongs. That it is neither of the foregoing is shown by its measurements, the head and body being 58 mm., the tail 34 mm., the forearm 40 mm., and the ear 18 mm. It is thus larger than *Murina hilgendorfi*, Peters, with a proportionately shorter tail, and a shorter forearm (43 mm. in *M. hilgendorfi*); and, of course, much larger than *M. ussuriensis*, Ognev.

Mr. Miller on receiving my specimen at the Smithsonian Institution wrote me:

"This is a *Murina* related to *M. huttoni*, a group hitherto known from India and South China. The Chinese form, *M. h. rubella*, is red, while the Indian race is described as 'light snuff-brown', whatever that may have meant in 1872. Both are imperfectly known. . . ." He goes on to say that my specimen probably represents a third undescribed species.

Under the circumstances I decided to describe it as a subspecies of *M. huttoni*. It appears to be darker than true *huttoni*, and has the upper incisors separated from the canines only by a narrow crack, and not a wide gap, while it is certainly different from the Chinese *M. h. rubella*, being brown in colour. It differs from the other two Manchurian forms in measurements, as shown above.

It is a peculiar looking bat, of a dusky brown colour, lighter below than above, with numerous long hairs growing on the posterior part of the body, on the webbing between the legs and tail, and on the legs and feet.

The specimen was taken in a house near I-mien-po, N. Kirin, late in October, 1914, which suggests that it might have been preparing to hibernate.

8. Japanese Long-eared Bat.

Plecotus auritus sacrimontis, Allen.

Plecotus sacrimontis, Allen, "Notes on Chiroptera," Bull. Mus. Comp. Zool. Harvard Coll. Cambridge, Mass. U.S.A., Vol. LII, No. 3, pp. 50-51, pl. fig. 6.

Recorded by Ognev from the Ussuri region, this form was first described by G. M. Allen, from a specimen taken on Mount Fuji in Japan, as "Resembling *P. auritus* of Europe, but larger, with a longer and broader skull. The tibia and the thumb are noticeably longer than in *P. auritus*, but the ears are of about the same size."

He describes its colour as "in alcohol, dorsally a uniform brown, nearest to bistre of Ridgway, the bases of the hairs much darker; ventrally the hairs are slate color at the bases, broadly tipped with light smoke gray." He gives its measurements as: head and body 42 mm; tail 44; ear 39; forearm 40, thumb 11.7, as against 40, 45, 36, 39 and 7 in an adult specimen of the European *P. auritus*. He also remarks that it is possible the mainland specimens (of Eastern Asia) would be indistinguishable from this island form, though he had not had an opportunity of ascertaining this.

It is evident, then, that Schrenck's record of *P. auritus* from the Amur refers in reality to this form, which after all can scarcely be considered as more than a subspecies of the European form.

While in the Tung Ling (Eastern Tombs) area of Chihli, which lies to the north-east of Peking, I secured a series of specimens of *Plecotus* in which the average length of the head and body is 52 mm. and that of the tail 51 mm., the ear being about 36 mm. and the forearm over 41 mm. This large form, which is evidently neither *P. auritus* or *P. a. sacrimontis*, probably occurs also in South-western Manchuria.

9. La Touche's Tadarida.

Tadarida latouchei, Thomas.

Tadarida latouchei, Thomas, Ann. and Mag. Nat. Hist. Ser. 9, Vol. V, March 1920, pp. 283-284.

This interesting species of bat, the only two known specimens of which were secured by Mr. La Touche at Chin-wang Tao, probably occurs in Southern Manchuria if not elsewhere in the country. Chin-wang Tao is situated on the northern shore of the Pe-chi-li Gulf, not more than twelve miles from Shang-hai Kuan, which marks the boundary line between Chihli province at this point and Manchuria, and it seems highly improbable that a species of bat should occur in Chin-wang Tao and not further east along the coast. On these grounds I include this species in our list of Manchurian mammals.

Mr. La Touche very kindly allowed me to examine his specimens before he presented them to the British Museum, and I had them photographed. As, however, my notes agree with those given by Mr. Thomas in his description, I prefer to quote the latter. The

Photo by Kodak Shop, Tientsin.

Two specimens of the peculiar bat *Tadarida latouchei*, Thos.,
collected by Mr. J. D. de La Touche at Chin-wang Tao.

nearest relation to this new species is Rafinesque's *Tadarida teniotis**, which has been recorded from Amoy on the South-east China coast, and at sea between Formosa and the mainland. As Mr. Thomas points out Chin-wang Tao is the farthest north-east that any *Tadarida* has yet been recorded .

Our form is closely allied to *T. teniotis*, but is conspicuously smaller. Its colour is described as "near 'clove-brown,' the hairs whitish at base, their extreme tips pale drab, forming a prominent light ticking. Under surface scarcely paler, the hairs of chin and throat brown to their tips, those of chest and belly light-tipped like those of the back."

The ears, though smaller than in *teniotis*, are larger than in most of the foregoing forms of bats, and of a characteristic shape.

The skull is "very similar in shape to that of *teniotis*, but markedly smaller; not so flattened as in many of the African species." Its greatest length is 21.7 mm.; condylo-basal length 21.2 mm.; zygomatic breadth 12.2 mm.; and inter-orbital width 4.2 mm.

The dimensions of the body are: head and body 76 mm.; tail 43 mm.; ear 23 mm.; forearm 53 mm. The wings are very long and narrow, by which feature the bat may be distinguished from other species while in the air.

**Cephalotis teniotis*, Rafinesque, Préc. des Decouv. Somial, p. 12.

CHAPTER II.

Hedgehogs, Moles, and Shrews.

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Order INSECTIVORA.

It may be taken as a general rule that insectivores occur more plentifully and in greater variety in a country favoured by a humid climate and an abundant vegetation, for these are the conditions necessary to an abundant insect life, and it is upon insects and worms that such mammals live. Certainly this is the case in China, where the north, being dry, is particularly poor in insectivores, while in the central and western areas, where the climate is relatively humid, and vegetation very luxurious, shrews and moles and other related species are both plentiful and varied. The same may be said of the Japanese Islands, where Anderson, who collected there, informed me that shrews and moles were extraordinarily pleutful.

It is all the more remarkable, then, that so far Manchuria has not yielded a greater number of species of these types of mammal than she has. Nevertheless, that country is richer in this respect than neighbouring North China and Mongolia.

Moles are certainly extremely plentiful, and though I failed to secure more than one specimen, I feel sure that more than one species occurs. Hedgehogs, from all accounts, are plentiful, and, though I am not satisfied that so many occur, some four species have been described by different naturalists. Three species of shrew have been described from Manchuria and four from Saghalin, which latter, in this respect, agrees with the Japanese Islands. The fact remains, however, that after making all allowances, we cannot, with any degree of certainty, include more than five insectivorous mammals in the mainland fauna of Manchuria, the Amur, and Primorskaya. These, with the four shrews from Saghalin Island, make a total of nine species for the whole Manchurian Region.

Family Erinaceidæ (Hedgehogs).

The hedgehogs of Eastern Asia, in our present rather fragmentary knowledg of them, form a group of mammals rather difficult to understand. A certain amount of confusion has been introduced into the subject by the somewhat haphazard naming of new species by certain Zoologists without any reference to earlier workers, which fact, taken in conjunction with the very limited and scattered material upon which we may work, makes a clear summing up of the case very difficult. However, there are a few marked and well defined forms, about which there can be no doubt, namely: (1) *Erinaceus dealbatus* Sw. described from Chefoo, Shantung, which occupies that province, and also the neighbouring province of Chihli; (2) *E. miodon* Thos., a very pale desert form from the Ordos Desert and North Shensi; (3) *E. hughi* Thos. from South-contral Shensi. The descriptions of these three are entirely satisfactory, and the validity of the species admits of no discussion. Not so when we came to the case of the hedgehogs that inhabit the Manchurian Region; for here we have several authorities describing, independently of, and even without reference to, each other's work, what appears to be but one, or at the most two, species under different names.

10. Amur Hedgehog.

Erinaceus amurensis, Schrenck.

Erinaceus europæus var. *amurensis*, Schrenck, Reisen und Forschungen in Amur-Lande, Band. I. Pl. II, 1859

This is a pale form of about the size and general appearance of the common European hedgehog (*Erinaceus europæus* L.) The spines have a white or cream band towards their distal ends, to which fact the light colour of the animal is due.

Pallas gives the hedgehog of Siberia, the Amur etc., as *E. auritus*, Gm. Both Schrenck and Radde mention this species as well as *E. europæus*, but they seem to agree that the Amur form is at least a distinct variety for Schrenck gives a figure with the title "*Erinaceus europæus* L. var. *amurensis*," while Radde also uses *amurensis* in describing figures of a skull from somewhere in this region in Plate V of his "Reisen in Süden von Ost-Siberien in der Jahren 1855-1859." (published in 1862).

Dr. Satunin in *Ann. Mus. Petersb. XI*, pp. 170-173, 1907, names two hedgehogs, one from the Khingan Mountains, which he calls *E. chinensis*, and one from "Süd-Ussurigebiet" (Southern Ussuri), which he calls *E. ussuriensis*.

Dr. J. A. Allen, in the *Bull. Amer. Mus. Nat. Hist, XIX*, *p.* 179, 1902, describes a hedgehog under the name of *E. orientalis* from Vladivostok—*i.e.*, to the South of Southern Ussuri.

It is highly improbable that the Khingan hedgehog is different from the Amur one, or that there are two forms in the South Ussurian region, so that in each case the oldest valid name must stand.

As Schrenck gives the figure and title, his name, *amurensis*, takes precedence over all later ones for the hedgehog of the Amur region; and if there is any difference between the South Ussurian (which area includes Vladivostok) form, and that from the Amur region, then Allen's name, *orientalis*, takes precedence over Satunin's *ussuriensis*, since the former was described in 1902 and the latter in 1907. Dr. Allen seems, however, to consider his hedgehog from Vladivostok as representative of the form that occurs throughout South-eastern Siberia; he suppresses Radde's use of the name *amurensis* on the grounds that he did not give a specific locality (though the name itself suggests a locality), while he totally ignores Schrenck's reference to, and naming of, the Amur hedgehog. If, then, as he seems to infer, his hedgehog from Vladivostok is typical of those occurring in this general region, then his name, *orientalis*, must also give place to Schrenck's much coming from all over this region, I prefer to consider the hedgehogs earlier name, *amurensis*; and until much more material is forth-of the Amur, Ussuri and Manchuria Proper as one species, quite distinct from *europæus*, to which the only name applicable is *amurensis*. This species probably merges into *E. dealbatus* in South-western Manchuria.*

Mr. Oldfield Thomas records a hedgehog from North Kirin, taken near Ch'ang Ch'un, to which he gives the name *Erinaceus amurensis* Schrenck. Of it he says: "The inter-relationships of *E. amurensis*, Schrenck, *dealbatus*, Swinh., *orientalis*, All., *chin-*

*In a recent paper (*Ann. & Mag. Hist., Vol. X. Ser. 9, No. 60, Dec. 1922, p. 616*) Mr. Mori describes the hedgehog from Corea as a distinct subspecies of the Amur hedgehog under the name *Erinaceus amurensis koreensis*. Type from Seoul.

ensis and *ussuriensis*, Sat., need much more material for their elucidation. All are very closely allied, and owing to the almost complete ignoring by each writer of his predecessor's work, no trustworthy comparisons have been made between them."

Mr. Miller has referred a specimen which I secured on the Upper Sungari River, Kirin, to Schrenck's *amurensis*, with the figure of which it agrees.

In describing his specimen from Vladivostok, Allen states that it is much lighter in colouration than *E. europæus*, and has a broader and more massive skull, with the zygomatic arches much more convex outwardly. "The chief difference in dentition is the very much larger size of *p.m.* 2 in *E. orientalis* and the nearly transverse position of *m.* 3." He does not consider that "this pale eastern form" can be identified with Erxleben's *E. sibiricus*, (*Syst. Reg. Anim.* 1777, *p.* 172.)

There is no need to describe the appearance of the hedgehog, or to say much about its habits, for everyone is familiar with the little animal. There is very little difference in appearance between any of the species mentioned above, such differences as do occur being usually in the dentition and skull proportions, or in the colour and markings of their spines.

Although the headgehog is included in the insectivores, it is omnivorous. It will eat fruit with almost as much avidity as beetles, not to mention snakes, bird's eggs, snails, and even flesh. The single specimen that I secured was caught in a trap baited with a dried prune, and set in a little runway in the long grass near a wood. I tried repeatedly to catch some more, but without success, I think because I failed to discover another runway. The one where I caught my specimen was a well beaten little track, from four to six inches in width, and it led off into a wood in one direction, and out into a wide field in the other. The natives told me that the hedgehog was very good eating, and in the event of no cooking utensil being handy, might be cooked by caking with mud and roasting in a wood fire. As hedgehogs are usually very fat one can understand that, to some people, they might be palatable, but, for my part, the smell is sufficient to destroy any desire for further investigation.

Family Talpidæ (Moles).

The mole family is a very large and somewhat difficult one. It contains a great many genera, many of which are peculiar to

Eastern Asia and the adjacent islands. *Talpa*, the genus to which the true moles of Europe and Asia belong, is represented in China by *T. longirostris*, M.-Edw., from Ssu-chuan, and in Japan by *T. mizura*, Gm. Besides this there are at least six other genera in Japan and China, represented by no less than sixteen species and subspecies. Some of these are extremely interesting, forming as they do connecting links between the true moles, on the one hand, and various branches of the *Insectivora*, on the other. But the only genus with which we are concerned here is that of *Mogera*, a single specimen of a species of which I secured in the forested area of West Kirin on the Fengtien border.

Mogera is represented in Japan by one species, and two subspecies, *M. wogura*, *M. w. hanai*, and *M. w. kobeœ*, in Corea by the subspecies *M. w. coreœ*, in China by the species *M. latouchei*, and in Manchuria by *M. robusta*.

As far as I know this is the only genus recorded from this country, though I think it highly probable that others occur. For instance it is almost certain that the Chihli mole (*Scaptochirus lepturus*, M.-Edw.), extends into South-western Manchuria. In any case moles of some form, or forms, are extremely plentiful throughout the forested areas of Manchuria, as I continually came across their workings, though I failed to trap any specimens.

11. Manchurian Mole.

Mogera robusta, Nehring.

Mogera robusta, A. Nehring, Uber *Mogera robusta n. sp.* und über *Meles sp.* von Vladivostock in Ost-sibirien, Stzungsber. Gesellesch, naturforsch Freunde. Berlin, 1901, pp. 95-108, June, 1891.

Originally described from Vladivostok, *Mogera robusta* is the largest member of its genus, in which particular it agrees with many other Manchurian mammals. The Corean species, *M. coreœ*, Thos., is much smaller, while La Touche's mole, *M. latouchei*, Thos., is little more than half the size. My specimen of *M. robusta* measured about 7 inches, while *M. latouchei* measures not more than 3¾ inches. The colour of the Manchurian species is a slate-grey inclined to a reddy-brown; and the tail is well covered with hairs, not almost naked and club-shaped as in *Scaptochirus*.

I have already described (see Vol. I) my attempts to trap moles in the Yu-shu-ch'a district. On the Sungari, at Yen-t'ung La-tzu, I found the excavations of these little creatures more

abundant than ever, and repeated all my previous expedients to catch a specimen, but failed. I sometimes spent long periods waiting for some mole to commence digging operations again where it had left off at my approach, but none ever would. If I went away, and returned a few minutes later, it would be to find that during my absence the little animal had been at work. Thus they seemed to be aware of my presence in some most mysterious way; always waiting till I had gone before they would run the risk of betraying their presence. Thinking it over I am inclined to the opinion that the little animals sensed my presence by their acute hearing. However still I kept some noise could, in all probability, be heard by the tunnellers. Be that as it may I could not catch my specimens. They would not enter my traps, no matter how carefully I set them, or with what I baited them. This is rather remarkable, for Anderson told me that those he secured in Japan and Corea were mostly caught in traps set above ground, and baited with various things from oat-meal to raisins.

Mogera is the commonest genus in Japan and is very different from *Scaptochirus*, which appears to have become specialized for a much dryer climate, and more barren soil. I secured a specimen of the latter on the very borders of the Ordos Desert.

When we come to the other Chinese genera *Scaptonyx*, *Uropsilus* and *Scapanulus*, we have to do, again, with forms that occupy a country more suited to the habits of the family to which they belong.

Family Soricidæ (Shrews).

Closely related to the moles, indeed actually connected with them by the two genera *Urotrichus*, and *Uropsilus*, which may be called mole-shrews, the true shrews differ in their small forefeet, which are not adapted to the excavating habits of the moles, and also in their long tails, and usually smaller size. Their habits are not subterranean, though they apparently live in burrows, and some forms, at least, do a certain amount of excavation. Eastern Asia, or perhaps it would be better to say South-eastern Asia, seems to be very rich in these interesting little animals and closely related forms. In recent years a great many new species have been described from Japan and China; while, as with the moles, there are several genera, some of which are new. Most interesting of these is, perhaps, *Blarinella* from West China.

Altogether there are some seven genera of shrews in the two countries, including twenty-five species and subspecies. Of these sixteen occur on the mainland, four in Saghalin Island, and the rest in the Japanese Islands.

The only species that can be said to belong to North China, exclusive of Manchuria, are *Chodsigoa hypsibia*, de Winton, and *Crocidura coreæ*, Thos., and of these only a very few specimens have ever been recorded.

So far very few specimens of shrews have been recorded from Manchuria, and of those records it is doubtful if all can be relied upon. For instance, Schrenck records *Sorex pygmæus*, Laxm., from the Amur, which is a very doubtful record at best.

My own investigations yielded but two species, *Crocidura lasiura*, Dobson, and *Sorex annexus*, Thos., while Ognev has recently described *S. tscherskii* from the Ussuri region.

12. Manchurian Musk-Shrew.

Crocidura lasiura, Dobson.

Crocidura lasiura, Dobson, Ann. and Mag. Nat. Hist., V, 1890, p. 31, fig. (dent.)

The Manchurian musk-shrew is rather larger than the usual run of shrews, and is of a uniform very dark, almost black colour. The species was originally described from the Ussuri region; but apparently occurs throughout Manchuria. I secured several specimens in the upper basin of the Sungari River in 1913, and one specimen on the Lower Sungari near its junction with the Amur. My specimens agree with Dobson's description. Mr. Oldfield Thomas in a paper in the *P.Z.S., Lond., 1906, p. 860,* referred a series of shrews collected by Anderson in Corea to this species, giving measurements of four adult specimens. In comparing these with the measurements of my specimens, I found that the Corean specimens are all smaller than the Manchurian ones, have shorter hind feet, and shorter tails. On the strength of this discrepancy in their relative sizes, I separated the Corean form from Dobson's *lasiura*, describing it as a distinct species under the name of *Crocidura thomasi* in the *Annals and Magazine of Natural History, series 8, Vol. XX., Oct. 1917.* I named the species after Mr. Oldfield Thomas to commemorate his work upon the *Mammalia* of these regions.

The Manchurian musk-shrew measures about $6\frac{1}{2}$ inches, 2 inches being taken up by the tail. The scent glands on the sides are very pronounced, and from them issues a pungent, musky smell, which appears to have a protective function, for I noticed that cats would not touch my specimens. Indeed the Chinese, whose name for this shrew is *Hsiang Hao*, or Scented Rat, told me the same thing. They said that neither dogs nor cats would touch these animals. The scent glands are present in both sexes.

I caught my specimens in a narrow ravine, at the bases of some tall umbelliferous plants, where, apparently, these animals are in the habit of burrowing for some grub or other, that is to be found at the roots.

These shrews, or at least the Corean form, apparently undergo a certain seasonal change in their pelage, for Mr. Thomas says of Anderson's specimens, that most were in the greyer winter coat, though one was in the short dark summer pelage.

It is interesting to note that here again we have the Manchurian form larger, and, judging from accounts, darker than that of a neighbouring region

This species is the only member of the genus *Crocidura* hitherto recorded from Manchuria, but it is probable that *Crocidura coreæ*, or some closely related form, occurs in the south and south-west, as this animal is found in both Corea and North China.

13. Corean Spider Shrew.

Sorex annexus, Thomas.

Sorex annexus, Thomas, P.Z.S., Lond., 1906 Pub. Apr. 11, 1907) pp. 859 and 860.

Specimens of shrews of this group which I secured in Manchuria have been referred to the above species, which, however, was originally described from Min-gyong, 110 miles south-east of Seoul, Corea.

Of it Mr. Thomas says that it is about the size of the European *Sorex aranius*, but belongs to the *S. minutus* group.

Its fur is fine and soft, the hairs of the back in winter specimens being about 6 mm. in length. In colour it is dark brown above and on the sides, and grey, faintly washed with drab, underneath. The tail is sparsely haired being slightly darker on the upper surface.

I secured a specimen on the Upper Sungari, and another on that river near its junction with the Amur, on the Heilungkiang bank. Ognev has recorded this species from the Ussuri region.

14. Tscherski's Spider Shrew.

Sorex tscherskii, Ognev.

Sorex tscherskii, Ognev, Bemerkungen über Chiroptera und Insectivora der Ussuri-Landes. Ann. Mus. Zool. Acad. Imp. Sci., St. Pétersbourg. Vol. 18, pp. 401-418, Dec. 1913 (Russian text).

I am unable to say anything at first hand of this shrew, described in Russian by Ognev in 1913. It may represent the shrew to which Schrenck gave the name *Sorex pygmæus*, Laxm., and which he found in the Amur region. Ognev's species was secured in the Ussuri region. It is a very small form, with light underparts, rather dark above. The head and body measure 43.4 mm.; tail 24 mm.; while the skull measures 13.4 mm. in its greatest length, the basal length being 11.6 mm.

The shrews recorded and described by Mr. Thomas from Saghalin Island are:—

1. *Sorex unguiculatus*, Dobson.
2. ,, *daphænodon*, Thomas.
3. ,, *shinto sævus*, Thomas.
4. ,, *minutus gracillimus*, Thomas.

It is probable that the form recorded by Schrenck from Saghalin as *S. vulgaris*, L. represents one of these.

15. Long-clawed Spider Shrew.

Sorex unguiculatus, Dobson.

Sorex unguiculatus, Dobson, Ann. and Mag. Nat. Hist., V, 1890, p. 155.

This shrew may be the form recorded by Schrenck under the name *Sorex vulgaris*, L., from the Amur and Saghalin, for Dobson described the species from a specimen taken by Schrenck in the latter island. Mr. Thomas speaks of it as a large-footed shrew, referring to its forepaws, which are unusually large, much larger than in any of the other species or subspecies recorded from these parts. Otherwise it appears to be very similar to them. Anderson secured specimens in Hokkaido (Yezo) as well as in Saghalin.

Type locality: Saghalin Island.
It has now been recorded from the Ussuri region by Ognev.

16. Saghalin Spider Shrew.

Sorex daphœnodon, Thomas.

Sorex daphœnodon, Thomas, P. Z. S., Lond., 1907, April 23 (pub. Aug. 1, 1907), pp. 407 and 408.

This species was described as new from specimens collected by Anderson at Dariné near Korsakoff on the Island of Saghalin. It belongs to the *Sorex araneus* group, having very heavily pigmented teeth, and a thickly haired tail. In size and general characteristics it agrees with *S. araneus*, is of a dark brown above, lighter sides, and dull greyish underparts. The forepaws are rather heavy, but not so large as in *S. unguiculatus*, the tail is heavily pencilled, and is thickly covered with hairs. Thomas further states that it is very like *S. annexus*, Thos., in general appearance, but is distinguishable by its hairy tail and differently coloured teeth.

The measurements given in his description are:

Head and body 59 mm.; tail 38 mm.; hind foot (without the nail) 12.5 mm.; ear 8 mm.

Type locality: Saghalin Island.

17. Yezo Spider Shrew.

Sorex shinto sævus, Thomas.

Sorex shinto sævus, Thomas, P. Z. S., Lond., 1907, April 23 (pub. Aug. 1, 1907), p. 408.

This interesting shrew, which occurs in Hokkaido, or Yezo, as well as in Saghalin Island, is another of Anderson's discoveries. It is closely related to the Japanese shrew, *Sorex shinto*, from further south in the Japanese Islands, but is larger throughout, excepting only the tail, which is about the same length in both animals Their colour is the same.

Measurements given in the original description are:

Head and body 69 mm.; tail 55 mm.; hind foot (S. U.) 12.5 mm.; ear 8 mm. From these it will be seen that this is a rather large shrew.

Type locality: Saghalin Island.

18. Little Spider Shrew.

Sorex minutus gracillimus, Thomas.

Sorex minutus gracillimus, Thomas, P. Z. S., Lond., 1907, April 23 (pub. Aug. 1, 1907), pp. 408 and 409.

Whether this species or *S. annexus* represents the shrew that Schrenck recorded as *S. pygmæus* is not easy to determine, for all these shrews are so much alike in general appearance. Mr. Thomas described it as a new subspecies of the European *S. minutus*, from the skull and one foot of a single specimen caught by Anderson, the other parts having been eaten by some other animal. Thus we know nothing of its colour, though its measurements were taken and preserved, and are found to correspond with those of the European form. The skull differs from that of true *minutus* in that it narrows abruptly towards the anterior end at the interorbital region, instead of evenly. The teeth also seem to be lighter.

Measurement: Head and body 51 mm.; tail 44 mm.; hind foot (S. U.) 11 mm.; ear 6 mm.

Type locality: Saghalin Island.

CHAPTER III.

The Woolly Tiger, Leopards and Smaller Cats.

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Order CARNIVORA.

We now come to the *Carnivora*, which order requires more than one chapter to do it justice. It contains many of the most interesting members of the Manchurian *Mammalia*, such, for instance, as the woolly tiger and the bears. The forest areas are well suited to these, and other, smaller carnivorous beasts, which find an abundant food supply in the birds and smaller rodents, not to mention the deer, and pigs, on which the large animals prey. The large number of valuable skins that are exported annually from Manchuria, and the Manchurian Region, testify to the value of this country as a fur producing area. Such skins as wolf, marten, fox, raccoon-dog, lynx, wild cat, mink, and badger find their way to the export markets of neighbouring China, but a larger number go, or perhaps we should now say, used to go, to Russia, especially the more valuable kinds such as the sable, ermine, stone-marten and otter. The most valuable skin of all is the sea otter, which comes from the mouth of the Amur, Saghalin Island and the Kurils.

Family Felidæ (Cats).

The *Felidæ* are chiefly interesting as having amongst them the most northerly representatives of such large cats as the tiger and the leopard, which usually belong more to tropical and sub-tropical regions. In point of numbers of species the family is not very rich, nor can it be claimed that the individuals are at all plentiful. Altogether there are not more than five or six species, that can be definitely put down as belonging to the Manchurian Region.

19. Woolly, or Siberian Tiger.

Felis tigris longipilis, Fitzinger.

Felis tigris longipilis, Fitzinger, SB. kais. Akad. Wien., LVIII, pt. 1, p. 455, 1868.

First and foremost of all the animals of the Manchurian forest is undoubtedly the great woolly, or Siberian Tiger. Not only is he the most dreaded of the carnivores, but he is the finest, largest, most formidable, and at the same time the most valuable of his kind. His thick winter coat fetches a high price in the fur-markets of the world, being worth far more than those of the Bengal, Persian or Sumatran tigers. Not only is his skin of value, but his whole carcass; for the Chinese believe that the bones, blood, heart, and even the flesh of the tiger have medicinal properties of rare power, and will pay a goodly price for decoctions brewed by the apothecary that contain such ingredients as powdered tiger's knee-cap, or clotted tiger's blood. The heart of the tiger is supposed to impart to the consumer the courage and strength of the tiger itself.

On this account the tiger has been hunted till he is almost extinct in most districts of North China, where once he was common, and now survives, even in Manchuria where he was once plentiful, only in the more remote and inaccessible forest areas, such as the Ch'ang-pai Shan, the Khingan Mountains, or the more or less unexplored and thinly settled areas of the Amur and Ussuri.

According to Mr. Pocock* the species to which the Siberian tiger belongs is Fitzinger's *Felis tigris longipilis*.** An earlier name is extant, namely, *Felis tigris mongolica*, Lesson†, but this was unaccompanied in the first place by any description, and so is invalid. In appearance this handsome animal differs from the other known races of tiger in its greater size, the greater thickness and length of its hair, which gives it its name, woolly tiger, and also the scientific one of *longipilis*, and in the more expansive areas of white in its colouring. The black stripes, too, are less heavy and fewer than in the other forms, while the general colour is lighter, at least in winter.

The Manchurian tiger attains a great size. I have been unable to obtain any really authentic records myself, but have frequently been told of enormous specimens. A skin I saw in Mukden must have been well over 12 feet, but I was unable to measure it. Ford Barclay, writing in "The Big Game of Asia and North America" on the Manchurian tiger, estimates the length of a tiger that was shot in the Vladivostok area at 13 ft. 5 in. It measured in the flesh from the tip of the nose to the base of the tail 10 ft. 5 in.

*P.Z.S. 1908 *pp.* 890-893.

**S.B. kais. Akad. Wien. LVIII, pt. 1, p. 455, 1868.

†Nouv. Tabl. Anim. Mamm., p. 50, 1842.

Young Manchurian tiger (*Felis tigris longipilis*, Fitz.) from the Chang-pai Shan, Kirin.

Adult Manchurian tiger, killed in the Chang-pai Shan and brought down in a frozen condition to Newchwang.

Allowing for a tail measurement of 3 ft., which is a very conservative estimate for the tail of so large an animal, it will be seen how the 13 ft. 5 in. is arrived at. Subsequently, he states, he interviewed Mr. Rowland Ward, who assured him that a skin was sold in London, that also came from this region, that must have belonged to an animal that measured 14 ft. This, of course, exceeds the largest Indian tiger on record by a considerable amount.

The range of this tiger is comparatively extensive. How far west it extends is difficult to say, but it certainly reaches the western border of the province of Shansi, in North China, and southward reaches at least to the middle of the southern half of that province. From there it extends northward into Mongolia and in a north-easterly direction through Chihli, where it still occurs in the wilder parts of the Tung Ling and Wei Ch'ang (the Eastern Tombs, and Imperial Hunting Grounds) to the North-east and North of Peking, and throughout the forested areas of Manchuria, the Amur, and Ussuri, into Primorsk in the extreme east, and south into North Corea. How far north it extends is not certain, but it probably extends almost up to the Yablonai Mountains.

Along the Yang-tzu Valley; and in the coastal provinces from Chekiang southward a tiger occurs, but this is more akin to the Indian tiger, and must not be confused with the Siberian form that occurs in North China. It is probable that formerly the ranges of the two races met and merged into each other somewhere about the course of the Yellow River.

Formerly the tiger was extremely plentiful in all the forested areas of Manchuria. Indeed, it is said, they were so plentiful along the route of the western portion of the Chinese Eastern Railway when under construction, that they became a positive pest, killing and carrying off workmen, till a regiment of Cossacks had to be sent to cope with the situation.

In North Corea tigers are said to be still fairly numerous, and every year some are killed there by sportsmen. In 1914, while on the Yalu River, I was told of a tiger that was killed within fifty miles of Antung, at the mouth of that river, the preceding winter.

In the forests of North Kirin and in Central and Western Heilungkiang tigers are killed by the local hunters every winter; but it is in the Amur Province, round the mouth of that river, that they are said to be most plentiful. They are also numerous in the Ussuri valley.

In North China the tiger is becoming increasingly rare. In 1909 I saw the tracks in the snow of what must have been a very large animal in the mountains of West Shansi, in the Ning-wu district. I also heard of tigers in the Ko-lan Chou area and the Chao-ch'êng Shan, both heavily forested districts further south in the same province. Further south still near P'ing-yang Fu a tiger was killed by the natives about the year 1912. I have seen skins of tigers that were said to have come from the Kuei-hua Ch'êng area in North Shansi, and they were undoubtedly of the true long-haired type. The natives in this area also insisted that tigers occurred there.

A stuffed tiger's skin used to repose in a temple in Lama Miao (Dolonor) in Inner Mongolia. It was said that the animal from which it came was killed in the streets of Lama Miao itself, having wandered from the Wei-ch'ang, or Hunting Grounds, to the east of that town.

According to Chinese accounts tigers also exist in Kansu, and on the Thibetan border, but I have been unable to get any satisfactory verification of this. It is more than likely that these animals occur for a considerable distance west of Kuei-hua Ch'êng into that little known mountainous country leading to the Ali Shan.

There is little to record regarding the habits of this tiger, that differs from those of the other known races. It keeps to the densest portions of the forest, feeding upon the game that abounds. It has been known to enter the huts, and even the more substantial houses of the Chinese and Russian settlers, and carry off the inmates. This must be under the stress of great hunger, for when the hunter sets out after the tiger in the ordinary course of events he experiences the greatest difficulty in coming up with his quarry.

It is said that wild pig is the favourite food of the woolly tiger, and from various accounts I heard of the remains of the former being found by hunters, this would seem to be the case. Nicholai, the Russian hunter who accompanied me into the forests of the I-mien-p'o district of North Kirin, actually showed me the spot where he had killed a large boar, which, being too heavy for him to carry home, was left out all night, and which was partially devoured by a tiger. The remains of the carcass were dragged off by the animal. Unfortunately, when the hunter came up with the tiger he was so excited that he missed the brute, which got clean away.

Various methods are employed in Manchuria in the pursuit of the tiger. The Russians chiefly go in for tracking it down in winter, when the snow makes trailing possible. This method, however, is very arduous, though if a man be strong and enduring he is usually fairly certain of getting his quarry once he runs across its trail. It often takes as much as ten days' or a fortnight's hard going, which, in the depth of winter, with Zero temperatures, and the deep snow to plough through, is no light undertaking. He has to camp on the trial, and follow it day by day, till he comes up with the game; and then there is always the danger of an ill directed shot, a savage, wounded animal and possibly disastrous results.

While at I-mien-p'o, I met a Russian hunter, who had killed several tigers in the past few years, and his reputation was great amongst the local fraternity of the gun. He had tracked down and killed, single handed, his quarry in every case.

Nicholai showed me the photograph of a tiger which had been poisoned by a Russian army officer, within a few miles of I-mien-p'o.

The Chinese, as a rule, have not the nerve to face the tiger as do the Russians, but resort to other means of accomplishing its capture. Pen-traps, pitfalls, and poison when they can get it, and also the small 'bomb,' which they use for bears, are frequently employed. The tiger is never hunted till the winter has set in, for, apart from the difficulty of hunting it before the snow is on the ground, the pelt is too valuable to allow of its being taken at any time except when in its prime.

But few Europeans, other than Russians, can count a woolly tiger amongst their trophies of the chase. This is due to the difficulty of getting local hunters to divulge their hard gleaned knowledge of the animals' whereabouts. So valuable is the skin and carcass, that if these men know of a tiger in the vicinity, they want it for themselves, and so keep their knowledge to themselves. It is possible to hire guides, but they usually lead the sportsman off the scent, instead of honestly trying to help him secure his quarry.

My own experiences in the Manchurian forest were very disappointing. I saw a fresh track in the mud beside a stream in the Samafalo area (near I-mien-p'o), and later after the first heavy fall of snow went with two Russians into the forest on the divide

between I-mien-p'o and Ninguta, in search of a tiger that was supposed to have been seen in the area, but we failed to come across its tracks.

The only tigers I saw in the country were two cubs at Hua-shu Lin-tzu on the Upper Sungari, that had been taken from their lair by a Chinese woodsman in the Ch'ang-pai Shan.

LEOPARDS.

There are two distinct species of leopard in the Manchurian Region, namely, *Felis fontanieri*, M.-Edw. and *F. villosa*, Bonhote. The former is the North China leopard, and as such extends with the mountains of North-eastern Chihli into South-western Manchuria. The range of Bonhote's species lies in exactly the opposite direction, since it was described from Amur Bay near Vladivostok.

There can be no doubt about the specific difference between these two forms, separated as they are by a wide stretch of territory apparently uninhabited by leopards at all. *F. villosa* is very much paler than *F. fontanieri*, with the spaces between the spots very much wider. *F. fontanieri* in turn differs from the Indian leopard in having larger spots, or rosettes, separated from each other by wider spaces, and in having the white of the underparts more extended. The fur of *fontanieri* is longer than that of the Indian form, while that of *villosa* is longer, thicker, and softer than that of *fontanieri*.

The exact limits of the ranges of these two forms has not been determined, though it is probable that at one time they met and merged into each other somewhere in Fengtien Province. It would seem that the whole of China north of the Yang-tzu River, South-western Manchuria, and parts of Inner Mongolia as well as West China are occupied by *fontanieri;* while Eastern and Northern Manchuria, the Amur and Primorsk form the home of *villosa*. How far north along the Siberian Coast the latter extends it is impossible as yet to say. The highlands of West China on the Thibetan borders, Thibet itself, and North India are occupied by the ounce or snow-leopard (*F. uncia.*) an Alpine form; which resembles to a certain extent *F. villosa*, but is paler, with much larger and less distinct rosettes, divided by even wider spaces. A species of leopard has been described from Corea under the name *Felis orientalis*. It appears to be a somewhat darker form than *fontanieri*.

20. North China Leopard.

Felis pardus fontanieri, Milne-Edwards.

Felis fontanieri, Milne-Edwards, Ann. des Sc. Nat. Zool. 5e serie, 1867, t. VIII, p. 375.

This leopard is found in Manchuria, as far as I have been able to ascertain, only in the extreme south-west. Here, in the mountains that continue in a North-easterly direction from Shan-hai Kuan, this formidable member of the cat family is occasionally met with, though it is not common. At one time it must have occurred in the mountains of the Liao-tung Peninsula, but not now.

A leopard's skin that I sent to the Smithsonian Institution from Shansi, and another secured by Anderson in Shensi, and sent to the British Museum, have both been identified as *F. fontanieri*, which species was originally described from near Peking. That the leopards from all over North China, and the south-western corner of Manchuria belong to a single species I am satisfied, as I have been able to examine skins from all parts.

The North China leopard is undoubtedly the handsomest of its kind. With its long, soft fur, pure white underparts, and rich yellow upper parts, together with its fine, distinct markings, and thick, almost bushy tail, ringed with black and white, it is a creature of unusual beauty. In size it appears to exceed the leopards of warmer countries, but this may be due to the thickness of its coat. It is doubtful if the largest specimens will be found to exceed in length record specimens from India or Africa. In Shansi, where the leopard is plentiful in the mountainous areas, I have frequently seen very large tracks, while an animal that measures 7 feet from tip to tip before it is skinned is not considered out of the ordinary.

The habits of the leopard are very similar to those of the tiger. It usually has a number of lairs, or caves, where it hides, when convenient, during the day, and in one of which the female has her family. Usually two cubs are born, which follow the mother for about six months. Like the tiger, the North China leopard does not confine itself to one district, but travels over a wide area, covering as much as twenty to thirty miles in a night. It nearly always follows the ridge-tops, where the wild pigs beat out regular paths. Its food consists of deer, game-birds and the

dogs and other domestic animals of mountain villages, the outskirts of which it frequently visits. It is particularly fond of dogs, and will never lose an opportunity of gorging to the full upon this diet. The Chinese say that a leopard that has eaten its fill of dog staggers away from its kill as though intoxicated, nor will it go far before lying down and going to sleep. Whether there is any truth in this statement I have never had the opportunity of determining, but it is certain that a great many leopards are shot by the natives over a dog kill.

The natives hunt the leopard with guns; not with any form of trap. Poison, however, is frequently used.

Recently the value of leopard skins has increased to a considerable extent, and where a good pelt used to cost from $8 (Mex.) to $10 (Mex.), they now fetch from $20 to $30 (Mex.).

21. Amur Leopard.

Felis pardus villosa, Bonhote.

Felis villosa, Bonhote, Ann. & Mag. Nat. Hist., ser. 7, Vol. XI, p. 475, May 1903.

Originally described from near Vladivostok (Amur Bay, E. Siberia), this pale form is probably the same as that which appears to inhabit the Lesser Khingan Mountains and the Ussuri region.

As already stated it may be distinguished from the North China leopard (*F. fontanieri*) by its much lighter colouring, which more nearly resembles that of the snow-leopard (*F. uncia*). Indeed Schrenck records what is undoubtedly our species under Müller's name for the snow-leopard, *F. irbis*, from the Amur region. *F. villosa*, in addition to its pale colouring, is marked with fewer rosettes, which are more widely separated from each other than in *F. fontanieri*. Its fur is longer and softer than in the latter, just as in the woolly tiger. It is a large animal, though so far there are very few records to go upon.

22. Lynx.

Felis lynx, L.

Felis lynx, L. Syst. Nat., 1766, 1, p. 63.

In the forests of Manchuria occurs a lynx, which Schrenck referred to the common European form; and in the absence of any material to go upon, or evidence to the contrary, his diagnosis must

be accepted. Skins seen by me from the forest area of Northern Mongolia, which country belongs to the same faunal region, very closely resembled, if they were not identical with Thibetan skins of the isabelline lynx (*F. isabellina*, Blythe),* and it is possible that the lynx that inhabits the Manchurian Region is referrable to this species.

Nicholai, my Russian hunter and guide, told me that he had shot a few lynxes round I-mien-p'o, N. Kirin, but that they were very rare. Unfortunately he had no skins to show me.

23. Small-eared Cat.
Felis microtis, Milne-Edwards.

Felis microtis, Milne. Edwards, Rech. Mamm. (April 1871), p. 221, pl. XXXI a.

That some form, or forms, of small wild cat occurs in the Manchurian Region is certain, for where ever I went the local inhabitants told me of some such animal.† A spotted wild cat occurs in North-eastern Chihli, and a skin collected by me in the Tung Ling area and sent to the Smithsonian Institution was referred by Mr. Gerrit S. Milier in a letter to me to Elliot's *Felis euptilura* (*P. Z. S. Lond. Dec. 1871, p. 760*). This was considerably darker in colour than the common spotted small-eared wild cat of North China, which is referrable to Milne-Edwards' *F. microtis*, originally described from North-western China. A specimen collected by me in the Yen-an Fu district of North Shensi corresponded exactly with *F. microtis*, and I have seen skins of the same animal from both Shansi and North Chihli. *F. euptilura*, however, was described as occurring in Central China, Canton and Shanghai, which is also the range of Gray's *F. chinensis*, and it is probable that the two names represent but the one form, the common spotted wild cat of Central and South China. Of two kittens which I bought from a native at Chin-wang Tao, close to the Sino-Manchurian border, and which were obviously of the same litter, one was dark like my Tung Ling specimen, and the other was light (buff-yellow or sandy) like *F. microtis;* but, what was most significant, they both had the typical small ears of the latter species.

Journ. As. Soc. Beng., XVI, 1847, *p.* 1178.

†Since this was written Mr. Mori has described a species of wild cat from Mukden, Manchuria, under the name *Felis manchurica* (*Ann. & Mag. Nat. Hist., vol. X, Ser. 9, No. 60, Dec. 1922, pp. 609-10.*) in which the ground colour is greyish white instead of sandy.

The lighter of the two grew into a fine full-sized animal, when it was indistinguishable from true *microtis*. It therefore seems probable that this form extends at least into Western and South-western Manchuria. As, however, I have seen a considerable number of the darker type of skin from Manchuria (exhibited for sale in the Mukden fur-shops, and exported from Tientsin) it would appear that in Central and Eastern Manchuria a darker form, or at least a darker phase, is prevalent. *F. microtis* may be recognized by its rich buff-yellow or sandy pelt studded with brownish or greyish-brown arrow-shaped spots, its beautifully striated face, ringed tail, and small black and white ears. It is about the size of the common wild cat of Europe. In the darker phase the colour is considerably greyer, and the spots less conspicuous.

The Chinese name is *Li-tzu*.

24. Manul.

Felis manul, Pallas.

Felis manul, Pallas, Reise III, 1776, p. 692.

The well known manul, the wild cat of the Central Asian steppes, probably extends into Manchurian territory in the extreme west, where the arid steppes of Eastern Mongolia intrude upon that country. It is known to occur in neighbouring North-eastern China, though no further south than the dry semi-desert conditions of the Sino-Mongolian borderland. I have seen skins in the Tientsin fur market said to have come from Mukden.

This is a large cat differing from the foregoing species in having longer fur, and in the absence of spots on the body. The face is striated and the thick, bushy tail barred. Its pelt is much valued on account of its fine quality.

It shares with other wild cats of these regions the Chinese name of *Li-tzu*.

CHAPTER IV.

Wolves, Wild Dogs, and Foxes.

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Wolves, Wild Dogs, and Foxes.

Family Canidæ.

The dog family is one that must always prove of interest to mankind, for the simple reason that its various members, domestic and wild, have always been so intimately connected with us throughout the history of our race. The domestic varieties have been and will continue to be our playmates from the cradle to years of maturity, and our companions and intimate friends in manhood. Stories of the wild species form part of the lore of our nurseries. The fox is an inseparable part of our country life; while the dread of the wolf has been handed down to us from ancestors to whom this ferocious animal was indeed a menace. Almost as familiar are the jackal and the more divergent hyæna. The timber wolf, coyote, dingo, hunting dog of South Africa and the wild dog of India are all well known to us by reason of the writings of our authors.

Thus it would seem that there is little left to say upon the *Canidæ* of any country. Yet in the course of my wanderings in the wilderness I have gathered a few facts concerning the members of this family that inhabit Eastern Asia, that may prove of interest to my readers, and so make no apology for setting them down here.

In China, Mongolia and Manchuria the dog family is well represented, not merely in species but in individuals. The wilder parts of these countries form the home of large numbers of wolves, foxes and, in places, that peculiar little animal the raccoon-dog. Even in thickly populated areas these animals are often plentiful.

In the Manchurian Region there are five distinct species belonging to the dog family, and it is probable that of these, there are several subspecies or varieties. These are the wolf, the red fox, and its colour phases the cross fox and black or silver fox, the corsac fox, the Arctic fox, the Siberian wild dog, and the raccoon dog.

Of these the wolf and corsac fox, particularly the latter, belong more especially to the Mongolian faunal-region. Nowhere in the forest areas did I come across the wolf, and though the natives told me of their existence, I could never be sure that they were not referring to the wild dog, especially as they used the word *t'sai*, which it will later be seen is applied to both the wolf and the wild dog. Nicholai, however, assured me that wolves do occur in the forest, in which case they probably belong to the true Siberian form, or else something akin to the North American timber wolf, and not to the plains wolf of the west, which appears to be Matschie's *Canis lupus tschiliensis*.

The common fox seems to belong to both plains and forest; the raccoon-dog more to the wide grassy stretches that flank the great rivers. Only the wild dog is purely of the forested areas. The Arctic fox apparently occurs in the extreme north of our region, where the Siberian faunal-region abutts on the Arctic faunal-region.

25. Siberian Wolf.

Canis lupus, L.

Canis lupus, L. Syst. Nat., 1766, I, p. 58.

It is probable that the wolf that inhabits Siberia extends into the forested areas of the Amur, Manchuria and the Primorsk; but, as already stated, the form that occurs in the western parts of Manchuria is to be referred to the subspecies *Canis lupus tschiliensis* Matsch., which inhabits the whole of North China at least as far south as the Yang-tzu Valley. If this surmise is correct, then little need be said of the former of these two forms; but the latter will bear a certain amount of discussion. The subject of the wolves of North China has been very much neglected, chiefly on account of the lack of material in European and American collections.

In the provinces of Chihli and Shansi, and probably also in Shensi and Kansu as well, there appear to be two varieties of wolves. Manchuria is to be referred to the subspecies *Canis lupus tschiliensis*. according to the locality. The *lang*, as recognized by the Chinese, is a large, gaunt animal, with a coarse coat. It is of an uniformly greyish colour, with but a slight tinge of yellow. The longer hairs are tipped with black, which colour increases on the back and forms a line down the front of the fore-leg. The fine, bushy tail is well tipped with black. The back of the ears are slightly ochraceous, as also is the muzzle. The chin and lower jaw almost to the angle of the latter are of a dark brown, the hairs being tipped with cream or grey.

The *tsai* is very much smaller, with a longer, more woolly coat. It is more yellow in general colour, while on the back there is a greater amount of black. The bushy tail is tipped with white instead of black, while there is very much less of the black line down the front of the fore-legs, which are ochraceous. The ears also are more ochraceous than in the *lang*, while the upper lips are creamy-white, which merges into a large grey patch below the eye. The chin is brown only at the tip; the throat is inclined to a creamy-white. The whole animal shows a brighter colouring than does the *lang*, with greater contrasts in the different parts.

I have seen many specimens of both these types, from various parts of the country, and though I cannot say definitely that they are two distinct forms, am yet inclined to that view.

In the extreme north of Shansi, and in Southern Mongolia the wolves are very much lighter in colour, with longer, softer and thicker coats than those from further south. They are also larger.

A point wherein the North China wolves differ from those of Siberia is the fact that they do not form into packs, but hunt singly or in couples, sometimes in threes, and only very rarely in larger numbers. In this connection, we have it on the authority of James that the wolves of the Tsi-tsi-har district go in large packs.

A large number of skins are exported from Tientsin, the most valuable being those brought down from Mongolia. The natives usually poison the wolf, though in North Shensi and on the Ordos border they use a clumsy but effective gin trap of native design and manufacture, Spring-guns are also used, and I have known hunters who would lie in wait along the paths frequented by wolves, and shoot the unsuspecting animals as they passed.

26. Red Fox.

Vulpes vulpes (L).

Canis vulpes, L., Syst. Nat., 1766, p. 59.

Of the common or red fox there are at least three colour phases found in the Manchurian Region. The red phase, which is the typical one is identical with the foxes commonly found in North China, which in turn so closely resemble the European form as to be inseparable, except, perhaps as a subspecies or variety. The other two colour phases correspond to what are called in North America the 'cross-fox' and the 'black-' or 'silver-fox.' In the former the

colour resembles the red fox except that there is a considerable amount of black about it; the hairs of the head, neck, back and tail are heavily tipped with black, the legs being inclined to be black up to the elbow and heel, while the feet are pure black. In the 'black' or 'silver' phase the pelt is pure black sometimes sprinkled with white hairs. This form is extremely valuable. Schrenck records *Canis vulpes* from the Amur. China seems to be occupied by a closely related form, *Vulpes huli*, Sw.

27. Corsac Fox.
Vulpes corsac, (L.)

Canis corsac, L. Syst. Nat., 1768, III, Append., p. 223.

This is the smallest and at the same time, perhaps, the prettiest of the canines that are found within the borders of Manchuria. It belongs to the Mongolian faunal-region, and only occurs in that part of Manchuria where the sandy steppes of the former country encroach upon the latter. It is essentially an animal of the desert, for life in which it is fitted by its pale, sandy-yellow colour. Its fur is very soft, and thick, enabling it to withstand the low temperatures and cruel blizzards of the regions it inhabits. Its range stretches from Western Manchuria right across Mongolia into Central Asia.

28. Arctic Fox.
Alopex lagopus (L.)

Canis lagopus, L. Syst. Nat., 1766, I., p. 59.

The white or Arctic fox is recorded by Schrenck from the Amur, where it occurs in sufficient numbers to render it a valuable asset to the fur trappers of the northern parts of this general region.

About two-thirds the size of the common fox, this handsome little animal is pure white in colour, with long, soft fur, and thick, bushy tail, its pelt being familiar to everybody in the 'white-fox' of the fur dealers. Its range appears to extend throughout Northern Siberia eastward into Alaska and northward to within ten degrees of the Pole. How far south it extends is difficult to say, but Schrenck's record of it in the Amur gives some indication.

According to fur-traders in these parts it extends as far south as Northern Mongolia, where also a large hare that turns white in winter occurs. The skins of the latter are made up in imitation of 'white-fox' and are sold as such in the markets of Peking and Tientsin.

29. Siberian Wild Dog.

Cyon alpinus, (Pallas).

Canis alpinus, Pallas, Zoographia Rosso-Asiatica, I., pp. 34 and 35, 1831.

Perhaps the most interesting canine which occurs in Manchuria is the Siberian wild dog, whose range extends across Siberia, southward through Zungaria into western Kansu, and eastward into the Manchurian Region, where it occurs at least as far south as the Kirin forests.

The Chinese of the last mentioned district call it *Yeh-kou* (wild dog) or *Tsai-kou* (wolf dog), and are very much afraid of it. They say it hunts deer and wild pigs, always working in large packs. It will not hesitate to attack man himself. During the winter the members of a pack have to move in single file along the deer paths after each fall of snow, till such time as a hard enough crust has formed to bear their weight, and allow them to run on the surface. Before the snow has thus hardened they may be hunted down easily, though it is considered advisable for several hunters to go together.

Frank Wallace in an article on the Kansu wapiti in the Badminton Magazine (Oct. 1913), mentions the fact that these deer "are much harried in the winter by a species of wild dog called 'tsaikou'," which he describes as "Smaller in size than a wolf, they will quickly clear a valley of game. I never saw one alive, but came across some skins which are red in colour." He is obviously referring to the Siberian wild dog, and it is interesting to note the Chinese name *Tsai-kou* cropping up again.

Schrenck encountered this animal in the Amur regions, where, apparently, it is comparatively plentiful. Nicholai, from whom, it will have been noticed, I gathered a lot of interesting information about the animals of the forested area round I-mien-p'o in North Kirin, told me that at one time wild dogs were plentiful in that area. On two occasions he saw a long line of them padding silently through the snow in the forest. He considered himself extremely lucky that he was not seen by them, for he said that more than one hunter had gone out into the wilds and had been devoured by these savage animals, who make up in numbers for what they lack in individual strength and size. He had frequently come across places where they had sat in circles in the snow, appar-

ently holding some sort of council. All who know anything of the dog family will agree that they do seem to hold such councils. I have seen three wolves sitting facing each other, exactly as though they were discussing some proposition, and then apparently having settled their course of action, have trotted off to carry it out.

A wild dog occurs along the Yang-tzu Valley and in South-east and South China where, however, it does not go about in packs. It is of a red colour, which agrees with Wallace's description of the West Kansu wild dog. This species one would take to be a connecting link between the Siberian wild dog on the one hand and the Indian species, the red dog of the Deccan, *Cyon deccanensis*, on the other. If it is specifically different from both these forms then its name should be *Cyon lepturus*, which Heude described using the generic name *Cuon*, in his "Mémoires concernant l'Histoire Naturelle de l'Empire Chinois." (Vol. II, pt. 2., p. 102). The Chinese name for the wild dog, at least in the Nanking and Ch'in-kiang districts, is *Kou-t'ou Hu*, or dog-headed fox.

In hunting, the wild dogs of the Manchurian Region display a good deal of sagacity, according to the accounts of natives. They pursue their quarry in relays, and give it no rest till it is worn down and finally succumbs, an easy prey. The lordly wapiti stag, whose great legs carry him through the forest in ten and twenty foot bounds cannot escape these relentless hunters, unless he can succeed in placing some wide and swift river between himself and them. The wild dogs of the genus *Cyon* differ from the wolves in having only two pairs of molars in the lower jaw instead of three, and also in their shorter skulls. The pelt of the Manchurian form is said to be a fine reddish colour, with long thick hair; but I was unable to verify this.

30. Raccoon-Dog.

Nyctereutes procyonides (Gray)

Canis procyonides, Gray, Illust. Isd. Zool. II, t., Mag. Nat. Hist. 1837, p. 578.

The raccoon-dog is one of the most peculiar looking of the members of the *Canidæ* to be met with in Eastern Asia. It is in reality a small dog, but its appearance, except for the tail which is not barred, is very much that of the raccoon. It is of a dull greyish-brown colour, sometimes with a tinge of rufous, sometimes

buffy. The long hairs are tipped with black, the underfur is thick and soft. There are two dark patches round the eyes, exactly as in the raccoon, while in size the two animals are well matched. Perhaps the dog is a little larger. The pelts are valuable, and, stripped of the long, coarse hairs, are very beautiful. In the latter state they are known to the Chinese as *Hao Jung*, and to European skin merchants as raccoon. The Chinese name for the animal is *Hao*.

The raccoon dog does not occur much in the forest itself, but, as already stated, it inhabits the grassy and willow-strewn flats, that border the great rivers. There it is trapped and shot in great numbers by the Chinese. It is most plentiful along the Lower Sungari and Amur Rivers, whence large numbers of skins are annually sent to Mukden, and thence exported either by way of Newchwang or Tientsin. The animal also occurs in South Manchuria, and in Corea. In China it occurs in the Tung Ling, northeast of Peking, in the valley of the Yang-tzu, and in South-eastern and Southern China. In the last named places it inhabits the brush and wooded areas.

After an examination and comparison of the skins of specimens from Manchuria, Chihli and the Lower Yang-tzu, I can find little difference between them. The Amur form is slightly the larger, and somewhat darker, with thicker underfur.*

*Mr. Mori has recently described the Corean form as distinct under the name *Nyctereutes koreensis* (*Ann. & Mag. Nat. Hist., Vol. X, Ser.* 9, *No.* 60, *Dec.* 1922, *pp.* 607-9), and it may be that the form inhabiting Manchuria and the Amur belongs to this species. Matschie described two species of *Nyctereutes* from the Manchurian Region, one from the Amur under *N. amurensis*, and the other from the Ussuri under the name *N. ussuriensis*. Without specimens from the Amur, Ussuri, Corea and China proper it is impossible to determine which if any of these more recently described forms are valid.

CHAPTER V.

The Bears of Manchuria.

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Family Ursidæ.

Considerable doubt and confusion exists as to the true status of the various species of East-Asiatic bears, nor does it appear to have been dispelled by the many attempts that have been made to arrive at a proper understanding of the subject. This is not the place, however, to embark upon any attempt to clear up the question as a whole, for we are concerned with but four of the many species of bears that have been described.

These are a brown bear of the *Ursus arctos* group, a black bear of the *thibetanus* group, a large black bear related to the North American grizzlies, which may be placed in the genus *Spelæus**, and the Polar bear. The names of these species respectively are:— (1) *Ursus mandchuricus* (Heude), (2) *Selenarctos ussuricus*, Heude, (3) *Spelæus cavifrons* (Heude) and (4) *Thalarctos maritimus*, Desm.

Of these the brown bear belongs to a well known group that extends from Europe throughout the greater part of Asia, reaching Northern India in the south, through Thibet into West China, and in a north-easterly direction throughout Siberia, Northern Mongolia, the forested regions of Manchuria into Yezo Island, and on into Alaska.** The black bear belongs to another group, whose range extends from North India through Thibet, China, the Manchurian Region and Corea into Japan in the east, Formosa in the south-east, and Hainan Island in the south.

The large black bear, which may be called the Manchurian grizzly, forms, with other related species, such as the Alaskan fish bear, a connecting link between the prehistoric Pyrennean cave bear, *Spelæus spelæus*, and the grizzlies of North America. It differs

*Brookes, Cat. Anat. & Zool. Museum, of Joshua Brooks, London, 1828.

**I am not altogether satisfied that the Alaskan brown bears should not be considered generically distinct from the European brown bears, and that they are not represented in Eastern Asia at least. A. de C. S.

from the brown bears in its coarse black coat, high frontal bones, and heavy, massive skull; and is very different from the black bears of the *thibetanus* type, the soles of whose feet put them in another group altogether.

31. Manchurian Brown Bear.
Ursus mandchuricus (Heude).

Ursarctos mandchuricus, Heude, Mém. Conc. l'Hist. Nat. l'Emp. Chin. Vol. IV, p. 23, pl. I, 1898.

After a careful consideration of the whole subject one is led to the conclusion that the above name is the correct one for the brown bear that inhabits the Manchurian Region. Heude described this animal in 1898, merely stating its colour to be brown. I received a brown bear's skin, said to be from the forest near Hai-lar, north-west from Harbin, in which the hair was brown heavily washed with buffy-cream, and I have seen other skins similarly coloured, as well as brown ones with very little or no light washing, all from Manchuria. It is not quite clear wherein this subspecies differs from true *arctos*, but it may be separated on geographical, if on no other, grounds.

Heude described it as from the Vladivostok district, which is probably as far south as it occurs. The skull is large, long, and narrow with a very slightly concave outline.

A related species has been described from Great Shantar Island by Middendorff* under the name *Ursus beringianus*. Specimens of this species have found their way from time to time into our museums and zoological gardens, and they show a thick, heavy coat of a dark brown colour, and very hairy ears. There are in the Sikawei Museum at Shanghai a few bear's skulls from the Bering region, which Heude identified as belonging to this species, and after a comparison of these with the type skull of *U. mandchuricus*** from Vladivostok, I am satisfied that the mainland form is distinct.

Of the habits of the Manchurian brown bear I cannot speak from personal experience, but presume from accounts of local hunters that they are the same as those of other parts. The skin of this

*Sib. Reise. Vol. I, pt. II, pl. I, 1851. (Great Shantar Island, near the mouth of the Amur, in the South Okhotsk Sea.)

**Since this was written Professor Lönnberg (P. Z. S. 1923, p. 94) has suggested that the Manchurian brown bear may be Gray's *Ursus lasiotus*, if which be the case that name must take precedence of Heude's *U. mandchuricus*. I cannot agree with this suggestion. A. de C. S.

animal is more valuable than of either of the next two species, and in consequence the animal is much hunted, and so is less common than the black bear, though probably more so than the grizzly.

Genus *Selenarctos*,* Heude. 1901. Created for the bears of the *Ursus thibetanus* group.

32. Manchurian Black Bear.

Selenarctos ussuricus, Heude.

Selenarctos ussuricus, Heude. Mem. Conc. l'Hist. Nat. de l'Emp. Chin. Vol V, p. 2, pl. II, fig. 10, 1901.

The Manchurian black bear is a larger animal than any of its near relations of the same group. The maximum weight it attains is from 500 lbs. to 600 lbs. I have seen many extremely large skins secured by the hunters in the I-mien-p'o district of North Kirin. The largest specimen I saw in the flesh was estimated at over 400 lbs., and it measured 6 ft. from tip to tip. This was a male that had not attained its full autumn weight. It might easily have put on another 50 lbs. to 100 lbs. before 'holing up' for the winter.

The habitat of this species extends from North Corea to the Amur, and at least from the Sea of Okhotsk to the region about the source of the Amur. How much further west it extends I have not been able to ascertain. It keeps to the forested and uninhabited areas of Manchuria, though in the autumn it sometimes ventures out on to the plains to rob the maize fields. In many places where I hardly expected to hear of the existence of any wild animals larger than hares or foxes, I was told that roedeer and bears occurred, the former feeding upon the young shoots of beans, millet or corn, and the latter making havoc in the maize fields.

After fattening upon autumn's rich store of acorns, pine seeds and berries, upon which it stuffs till winter snows set in, the black bear finds some hollow tree or cavity left by the up-pulled roots of some giant windfall, and there falls into that winter slumber that lasts till late in February or March of the following spring. The female has her litter, generally consisting of two cubs, during this period. The little things are thus born into a snug, safe world, where they grow rapidly (for they are very small and naked when

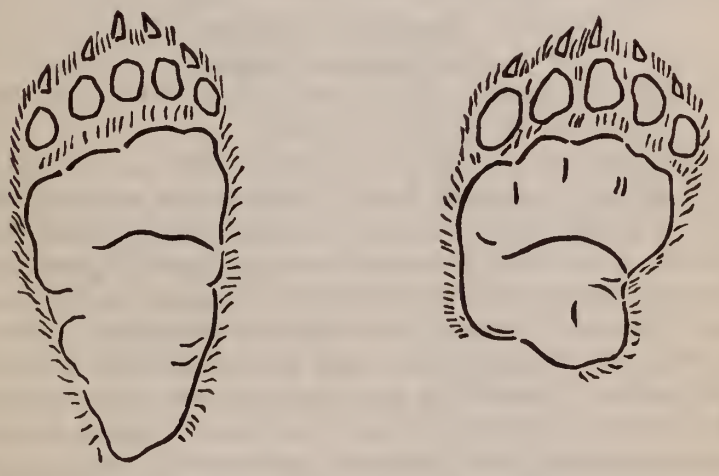
*Pocock (Ann. Mag. Nat. Hist., Ser. 8, Vol. XX, pp. 128-130, 1917) used *Arcticonus*.

born), and when their mother leaves the shelter in spring, are able to accompany her. It is now that the one great annual struggle occurs in the life of the black bear, for food is scarce and appetites are keen and large. Left over berries, and nuts that were hidden by the first fall of snow, grubs of insects lying under windfalls and stones, and possibly the carcasses of such animals as have succombed during the winter, and have escaped the notice of non-hibernating carnivores, appear to be the only available food, and, as may be guessed, it is none too plentiful. When in this plight the bears find a true friend in the squirrels, who, foolish little creatures that they are, have made large stores of nuts in secret places, and then, apparently, have forgotten all about them. These stores help the hungry bears in their hour of need. Ants, too, do their share, for their nests, consisting of piles of minute twigs, chips of grass and other debris, are everywhere, and usually yield a supply of fat white larvæ. Now also are the hollows of all trees worth special investigation for the nests of wild bees, and the bear with his long, strong claws and powerful, muscular arms is specially adapted to tearing open walls of wood and bark that guard the golden store, and fat, white grubs of the apiary. Thus the bear fights through the spring and early summer, till the early fructifying plants, such as the wild apricot, come to its relief, and thence on the struggle for life becomes less keen, and it becomes possible to store fat upon the shrunken body in preparation for the next winter's sleep.

My experience of the Manchurian black bear is that it does not care for a flesh diet, and I have never heard of this animal attacking domestic cattle or wild game. A young bear that I had would never eat flesh in any form; its diet was purely vegetarian. In this the species appears to differ from the Himalayan black bear, for Captain Haughton in his "Sport and Folklore in the Himalayas" gives a vivid account of shooting one of these animals over the carcass of a bullock, and also of a bear attacking and killing a bullock belonging to a village.

The hunting of the black bear in the Manchurian Region is carried out in various ways. The favourite, and most effective one is by means of a cleverly constructed bomb, coated with honey and lin-seed oil boiled down to a paste, which is hung at a suitable height above the ground along one of the many bear-paths, that intersect the underbrush of the woods in all directions. No bear

can resist the smell of this treacherous dainty, which, upon being seized explodes, shattering the victim's skull and jaw without injuring the skin. Spring-guns, pit-falls and log pen-traps are also used. The Chinese do not like shooting the bear, for it is too formidable and treacherous an antagonist to be attacked with the primitive, muzzle-loading matchlocks with which they are mostly armed. When wounded the bear's one idea seems to be to get even with its foe, to accomplish which it will fain death till its persecutor comes within reach. Then it is usually all over with the hunter, for once within the clutches of a bear there is little chance of escape. The ferocity and strength of the animal is such that the victim is torn to pieces as a bird by a cat. The Russian hunters, on the other hand, delight to hunt the bear with rifles and dogs, and very fine sport they enjoy. Elsewhere I have given details of my own encounters with the black bear, so need not dwell further upon the subject here.



Soles of left fore and hind feet of the Manchurian Black Bear (*Selenarctos ussuricus*, Heude.)

Of a pure black colour relieved only by a conspicuous white crescent on the chest, and usually a white chin, the Manchurian black-bear has, in winter, a long, soft coat. The hairs of the side of the neck develope into a mane, and measure as much as eight inches in length. This species differs from the Himalayan and

Thibetan form in its heavier and larger teeth, heavier jaw, and proportionately narrower skull. The intervening species of West China are intermediate in these characteristics, while the Japanese and Hainan forms are very much smaller, though in all these species the colours seem to be the same. The group differs from the brown bears and grizzlies in the wider, shorter skull with a convex outline, and in the fact that the soles of the fore-paws have the heel-pad coalesced with the carpel and meta-carpel pads, and not separated, as in the two former groups. It thus appears to be related to the sloth-bear (*Melursus*) and the little Malayan bear, (*Helarctus*) in both of which the pads of the fore-feet are similarly coalesced, while the hair is black, with white crescents (not very pronounced in the Malayan bear) on the chest, and the skulls are short and broad.

Genus *Spelæus*,* Brookes, 1828. Cat. Anat. and Zool. Mus. of Joshua Brookes, London, Created for the prehistoric cave bears with which the grizzlies are now classed.

33. Manchurian Grizzly.

Spelæus cavifrons (Heude.)

Melanarctos cavifrons, Heude, Mem. Conc. l'Hist. Nat. l'Emp. Chin. Vol. V. p. 1. pl. 1. 1901.

The great bear, to which I have given the name of the Manchurian grizzly, and which Heude first described as a new species under the specific name of *cavifrons*, placing it in his genus *Melanarctos*, which he specially created for the purpose, is probably one of the most interesting of the Manchurian mammals, for, as already stated, it appears to form a connecting link between the prehistoric cave bears of Western Europe and the present day grizzlies of North America. Indeed, its skull shows an extraordinary likeness to that of the extinct *Spelæus spelæus* (Rosllr.) though neither as large nor massive. It is, however, more massive than the skulls of the various forms of brown bear, and differs particularly in the high frontal bones, which make the outline of the skull much more concave. The muzzle, too, is deep and the lower jaws very heavy. The hair is black and coarse, though on the shoulders the bases of the hairs show a light buffy-brown colour that is very peculiar. The muzzel is brown and the tips of the hairs on the head are brownish. There is no sign of a white crescent on the chest. The soles of both the fore and hind feet differ from those of the black bear,

*The name *Danis* used by Pocock being pre-occupied *Spelæus* must be used here.

though they more nearly resemble those of the brown bear. The sole of the front foot is broad and short, with the posterior (heel) portion divided from the anterior portion. In the hind foot the sole is cut across from the inner side by a deep hair-filled cleft, while in the black bear the sole is without a cleft from heel to the bases of the digits. In size this species is truly formidable. The specimen that I shot in the forest north of I-mien-p'o was estimated at over 600 lbs. in weight, and, at that, was in a poor condition, having comparatively little of the autumn fat upon its

Soles of left fore and hind feet of the Manchurian Grizzly (*Spelæus cavifrons*, Heude.)

body. At its prime it would certainly have scaled nearer 800 lbs. The Russians told me that specimens going up to 1000 lbs. were known. My specimen measured 7 ft. from tip to tip, and stood about 40 inches at the shoulder. It was 60 inches round the chest and 30 inches round the upper arm. The skull measured 16 inches in length, and 9¼ inches in width, and was very heavy and rugged. The hair was coarse, and neither very long nor very thick.

The distribution of this species is doubtful, or, perhaps it would be more correct to say, is not known. So far it has been recorded only from the forest near Tsi-tsi-har in South-western Heilung-kiang, and from the forest in the I-mien-p'o district of North Kirin. From all accounts, however, it occurs throughout the Manchurian forest, and on into the Primorsk, for wherever I went I heard the natives speak of a large bear that was not a brown bear yet was different from the black bear. The Chinese spoke of this as *Hua Yao-tzu*, or piebald kidney, and described it as being grizzled across the back.

Nicholai told me that this species is much rarer than the black bear, occurring in the proportion of one in twenty of the bears shot in the district. He claimed to have shot about twenty specimens, but I am doubtful of this statement.

The habits of the Manchurian grizzly are in many ways similar to those of the black bear. It ranges the forest in search of its food, but is less prone to visit the maize-fields of the settlers. Though it eats with avidity all the things that the black bear likes, there can be no doubt that it is fond of a flesh diet.

In disposition it is much fiercer than the black bear, more prone to attack man at sight, and when having killed a man it will devour him. A case of this occurred during my first visit to I-mien-p'o. When going north from that town to hunt bears our party was asked to look out for a native hunter who had been missing for some time. We did not find any trace of this man, but a month later some Russian hunters found his remains in the forest, and all round were the tracks of one of these grizzlies and her cubs. All that was left of the poor fellow were his queue, a few shreds of clothing and his gun.

Nicholai said that this animal does not hibernate, but it is more likely that only the older animals give up going into winter quarters.

Manchurian grizzly (*Spelæus cavifrons*, Heude) shot by the author in the I-mien-po district, N. Kirin.

Group of Russian hunters with the author and large grizzly shot in the Kirin forest.

CHAPTER VI.

The Mustelines.

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The Mustelines.

Family Mustelidæ.

The family *Mustelidæ* is an important one as far as Manchuria is concerned, for it contains the sable, which, with the larger deer and the tiger, forms the chief object of chase amongst the hunters of these parts. Indeed, judging from Fraser's account on the authority of Margaritoff of the Orotchis—*i.e* the tartars of the Primorsk Coast—sable hunting is their chief end and aim in existence. It is certain that it was largely the presence of the sable throughout Siberia and in the Amur and Primorsk that led the Russian pioneers and conquerors across that wide stretch of country. But for the sable their spread eastward would undoubtedly have been a slow process compared with what it was. Thus we must look upon this little animal as having a very important bearing upon the history of these regions. But not alone must the sable be considered valuable, for this family also numbers the pine marten, stone marten, otter, ermine and wolverine amongst its valuable members, and all of which are to be found in various parts of Siberia and Manchuria; while the related sea otter, the most valuable of all, occurs on the coasts and round the island of Saghalin and the Kurils. In the Manchurian Region the yellow-throated marten, polecat, mink, weasel and badger also have a value to the local hunter and fur-trapper, for they can get a dollar or so, sometimes more, for their pelts. This means that every member of this family contributes to the wealth of the country, so that, in its way, it is the most important with which we have to deal. The only trouble is that with the unrestricted hunting that takes place, and the steady increase in the settlement of the country, this valuable supply of fur-bearing animals is rapidly diminishing. Altogether we have some twelve species to consider under this group of carnivores occurring in the Manchurian Region.

35. Sable.

Martes zibellina, (L.)

Mustela zibellina, L. Syst. Nat., Ed. 12, I, 1766, p. 68.

Very closely allied to the pine marten, the sable is thought by some to be one and the same animal, those specimens with the finer, darker coats being sables, and those with the lighter, less valuable pelts being martens. This is an error, and, doubtless, were more complete and properly measured specimens available, the matter would admit of but little discussion.

From the earliest times in the history of Russia the sable, as has already been indicated, has played an important part in the eastward spread of that Empire. It is evident that one of the chief objects of the conquest of Siberia was to secure a supply of sable skins for the Imperial Government, and it is significant that the conquering Cossacks, under the redoubtable and renowned Yermak, and other leaders, always imposed a heavy tribute of sable skins upon the Tartar tribes they defeated, and brought under subjection, while such support as they themselves received from the Tsars of Russia depended largely upon the prospects they could hold out of a good return in these valuable furs.

The Manchurian sable does not come up to those from the Amur, Primorskaya and Siberia in the value of its pelt, but this is doubtless due to the less severe climatic conditions under which it lives. Nevertheless, extremely valuable skins are sometimes secured in Manchuria, especially in Heilungkiang. It is said that the Chinese nearly always hunt the sable by running it down with dogs. They say that the value of the skin decreases if the animal is caught in a trap; but the probable real explanation is that the sable is too valuable an animal to let go once it has been sighted, and by pursuring it through the woods with the help of their dogs, whose quick sight can follow the movements of the animal through the trees, give it no rest till it finally falls a prey to exhaustion.

The Chinese name for the sable is *Tiao*, or *Tiao-shu;* and the wearing of its skin in pre-republican days was confined only to the official classes, and by them was only worn in their official robes.

Fraser, quoting from Margaritoff gives an interesting account of the pursuit of the sables by the Orotchis, a small tribe of Fish-skin Tartars that inhabit the coastal regions of the Amur and Primorskaya. In autumn the Orotchi uses a noose set on a log

across some stream, and attached to a bent-over rod, which, when the animal releases it, springs up and suspends the victim by the neck. This form of trap is a favourite one with the North American Indians.

"When the rivers get frozen over hard, the *plenka* (as the noose is called) becomes useless, as the sables then cross on the ice and have no need of a bridge. The Orotchi now sets his spring-bows. In China also these are used ..... A long string connected with the extemporized trigger which keeps the bow bent, is stretched across the animal's run, and made fast to a tree. The bow is raised on a rest elevated more or less from the ground in proportion as the animal, for whose heart the arrow is intended, is large or small,—for a reindeer, two feet; for an otter, less; and for a sable still less. Other sable traps are made in holes in trees about three feet or less from the ground. A bait is put in the hole to which is attached a slender stick which props up a heavy beam until the sable himself shakes out the support, brings down the beam, and is crushed to death." He also states that "A keen and sturdy hunter can still get in a year, say 70 sables, 30 foxes, and 75 head of other game." This was over twenty years ago, and as even then the hunters were complaining that game was diminishing, it is highly improbable that any such bags are made now.

The habits of the sable are very much those of the pine marten, It is a frequenter of the forests and is a shy and retiring animal. It is an expert climber.

In Siberia this animal is protected by the Government, and comparatively recently it was given a five years closed season. Unfortunately the Chinese Government is not alive to the value of its game and fur-bearing animals and birds, and so affords no manner of protection. There can be only one result of this; complete extinction of the sable in the provinces of Heilungkiang and Kirin.

36. Pine Marten.

Martes martes, (L.)

Mustela martes, L., Syst. Nat., I, 1766, p. 67.

Somewhat more common than the sable, and frequently mistaken for it, the pine marten is sold in Manchuria and China as

sable of an inferior quality. It may be distinguished from the sable by its lighter, browner, and less slaty coloured pelage. The foreneck and throat are yellowish or orange in the marten, the same colour as the body in the sable. The marten also has a considerably longer tail than the sable.

In its distribution the marten agrees with the sable, both animals being found in the same localities. An inhabitant of the forest the marten is nocturnal in its habits, though like all its kind, it may not infrequently be met abroad in daylight. It is largely arboreal in its habits, living upon birds, squirrels, and other small mammals.

37. Stone Marten.

Martes foina (Erxleben)

Mustela foina Erxleben, Syst. R. An. 1177, p. 458.

This handsome musteline occurs in Manchuria, where, as in North China, it inhabits the rocky places, from which it gets its name. It is abundant in the western portion of the country, whence its range spreads westward into the mountains of Eastern Mongolia, and on through Northern Chihli, Shansi, and into West China. I have seen large consignments of skins from Mukden, as well as from North Shansi, and can detect no difference between the specimens from the two regions.

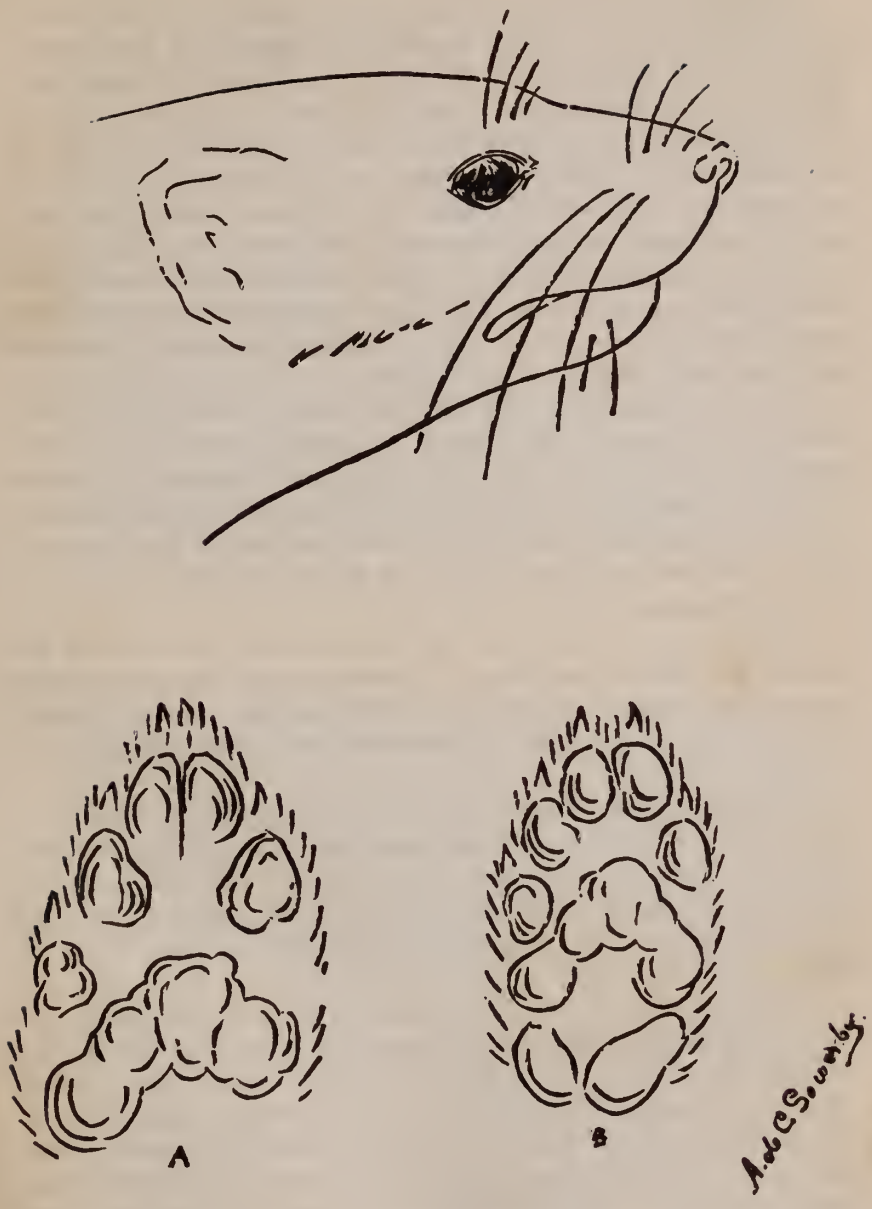
Of a fine slate-brown, with very light under-fur, and a pure white patch on the throat, the stone marten is easily distinguishable from the pine marten or sable. A further distinguishing characteristic is the length of the tail, which is two thirds that of the head and body in the stone marten and not more than half in the other two species. The fur is long and soft. In size the animal agress with the pine marten.

The Chinese name of it is *Sao-shueh.*

38. Yellow-throated Marten.

Charronia flavigula borealis, (Radde.)

Martes flavigula var. *borealis,* Radde. Reisen in Süd. von Ost. Sib., Vol. I, 1862 pl. p. 19.



Head of Northern Yellow-throated Marten (*Charronia flavigula borealis*, Radde.) A. Sole of left hind foot, B. of left fore foot.

The large yellow-throated marten, a northern representative of the Indian marten, is very common throughout the Manchurian Region, where it is known to the Chinese as *Mi-kou*, or honey dog. This well-marked animal is undoubtedly one of the handsomest of its kind, though its pelt is of little value as compared with that of the sable. In the splendid specimen, which Nicholai shot for me in the woods to the east of I-mien-p'o, the head, legs and tail are of a shiny black; the chin is white, the white extending to the base of the ear, taking in part of the upper lip, and merging into a pale yellow on the throat, which gives place to rich orange-yellow on the front and sides of the neck; the nape of the neck is brownish with the tips of the long hairs yellow ochre; the ochre colour increases on the shoulders and along the back, shading into a grey-brown on the rump; the chest is yellow buff, shading into buff-brown on the belly. It was one of the most handsome specimens I ever saw, those occuring in North China all being less brightly coloured. The tail is very long, almost as long as the head and body. The body is about the size of the fox, the legs being considerably shorter.

Living an arboreal life, this fierce animal preys upon the smaller denizens of the forest. It would seem, from its Chinese name, that it attacks the hives of wild bees; but, though vouched for by the natives, I did not personally come across any proof of this fact.

In Shansi and Shensi where it is known to the Chinese as *Huang-yao*, it inhabits the hills and mountains, being especially abundant in the *loess* country. Here it raids the village chicken yards, and commits great havoc. It has been known to kill, and carry off domestic cats; from which fact its ferocity many be gathered.

Its range extends from the Amur to the Thibetan border and southward through West China, where it merges into that of other forms.* A specimen I secured in the T'ai-pei Shan region of Southwestern Shensi had the yellow of the throat very much lighter, the back also being lighter. It entirely lacked the intense colouring of my Manchurian specimen. The latter was a full grown male, and it measured: Head and body, 577 mm.; tail, 440 mm.; hind foot, 103 mm.; ear, 49 mm.

*Recently a subspecies has been described from Corea under the name *Charronia flavigula koreana* by Mori: *Ann. & Mag. Nat. Hist., Vol. X, Ser.* 9, *No.* 60, *Dec.* 1922, *pp.* 610-12.

The Manchurian Goral (*Urotragus raddeanus*, Heude), I-mien-po district, N. Kirin.

The Yellow-throated Marten (*Charronia flavigula borealis*, Radde), I-mien-po district, N. Kirin.

41. Pole-Cat.

Mustela putorius subsp. incon.

That a polecat of some form exists in Western Manchuria, especially that part adjoining the East Mongolian frontier, is evident from the fact that skins of this animal are received in Tientsin from both Mongolia and Western Manchuria. These are of a rather light variety and either represent *Mustela tiarata*, which I have secured in North Shansi on the Mongolian border or some new and undescribed form.

42. Ermine.

Mustela erminea, L.

Mustela erminea, L., Syst. Nat. I, 1766, p. 68.

Schrenck records the ermine or stoat, as it is usually called in the British Isles, as occurring in the Amur region. Though I did not actually come across it in those parts of Manchuria visited by me, it is, nevertheless, well known to the native hunters from whom I got sufficient details of it and the method employed in its capture to satisfy me of its identity.

The Chinese call this little animal *Sao-shueh*, and distinguish it from our next species, the true weasel, which they call *Pei-shu*, or white rat, by the black tip to its tail and its larger size.

The ermine is eagerly sought after by native hunters in these parts during the winter months, when its beautiful white pelt is of considerable value. They trap it in cleverly constructed dead-falls, based on the fact that these, and incidentally many other small mammals of the forest, invariably run along any old log or windfall that they encounter in their wanderings though the forest.

The stoat is so well known as to need no description here. It is easily distinguishable from the weasel by its larger size, more brownish, less chocolate coloured coat, and the black tip to its tail.

43. Manchurian Weasel.

Mustela nivalis pygmaeus, Allen.

Mustela (*Arctogale*) *pygmaeus*, Allen, Bull. Amer. Mus. Nat. Hist., Vol. 19, p. 176, March 1903.

The last of the weasel-like mustelines is the little weasel itself, specimens of which I secured both in the Upper Sungari basin and the I-mien-p'o district.

Of a chocolate-brown colour above, and white below this pretty little animal differs from the European form, *Mustela nivalis*, only in size. It is considerably smaller. It inhabits the forest regions and appears to be fairly common.

When it changes its brown coat for the pure white winter one, it becomes of value to the fur-trapper. The skin is then known to the Chinese as *Pai-shu*, or white rat. Its value is inferior to that of the ermine from which it may be distinguished by the total absence of any yellow tinge and the absence of the black tip to the tail. A specimen secured by me near I-mien-p'o measured: head and body, 153 mm.; tail, 27 mm.; hind foot 22 mm.; ear, 13 mm.

44. Wolverine.

Gulo luscus, L.

Gulo luscus, L., Syst. Nat. I, 1766, p. 71.

One of the animals of the forested areas of the Manchurian Region is the wolverine, whose voracity and greed has earned for it the popular name of glutton. Though I was not fortunate enough to come across any specimens, I heard sufficient from authentic sources to convince me that the animal is fairly common, at least in the northern forested area. Nicholai described very accurately one which he shot near I-mine-p'o, while an English sportsman who hunted in the same area told me that he shot one.

Schrenck gives the wolverine in his list of animals from the Amur.

As in North America, so in Manchuria, this savage and cunning beast is the trapper's greatest enemy, for it will rob the traps of their valuable catches, and is too clever to be caught itself.

I did not discover any Chinese name for this animal, though its valuable pelt is well known. I once saw a skin from the Urga district in Northern Mongolia. It was of a light brown round the flanks and on the rump, the middle of the back being of a much darker colour, the face, legs and lower parts darker still.

Short-legged, heavy of body and powerfully built, with powerful jaws, strong teeth and long, sharp claws, besides being endowed with almost uncanny intelligence, the wolverine is thoroughly well fitted for a life of depredation, and though little bigger than a fox, though considerably heavier, it is said to be able to pull down and slay even the larger deer.

45. Amur Badger.

Meles amurensis, Schrenck.

Meles taxus, var. *amurensis*, Schrenck, Reisen and Forschungen in Amurlande, Vol. I. pl. I, pp. 17-24, 1859.

The badger of the Amur region was described by Schrenck as a variety of the European form, and it is probable that the same form occurs in Manchuria Proper at least in the forested areas, and Western Fengtien. To the west and south-west its place is probably taken by Milne-Edwards' *Meles leptorhynchus*, which occurs throughout North China and Inner and Eastern Mongolia. Another species *M. melanogenys* has been described by Allen from Fusan in Corea, and it is possible that this form extends into South Manchuria.

I secured a single immature specimen in the Upper Sungari basin, which it was found impossible to identify; but it agreed with other fully adult specimens, whose pelts I examined, in being darker than the North China form, and so shows a closer relationship to the European species.

The skins of badgers are used by Manchurian hunters in a novel way. They are partially tanned, and then fastened on to the back of the belt, and hang, hair side out, over the buttocks in such a way that the hunter always has a dry seat. Being very oily and thick, the badger's skin is damp resisting, and is in great demand for bed-rugs amongst the Chinese. The animal is taken by digging it out of its burrow.

The Chinese name is *Huan*.

46. Otter.

Lutra lutra (L.)

Mustala lutra, L., Syst. Nat. I, 1766, p. 66.

The otter of the Manchurian region must be referred to the European form *Lutra lutra* at least till sufficiently extensive series of specimens have been collected to make proper comparisons possible between it, the common otter of Europe and the North American otter (*L. canadensis*). Only once did I have the opportunity of seeing a perfect specimen of the otter in Manchuria, and it must be confessed I could see nothing to distinguish it from the European form, though, it should be remembered, of course, that I had no specimen with which to compare it, nor was I able

to secure the specimen. This was in the I-mien-p'o district of Kirin. The natives who had trapped it and had it alive in a cage asked too high a price. Instead of bargaining in the usual Chinese way, they killed and ate the otter, throwing the skull and bones to their dogs, after which they brought me the mangled pelt.

Schrenck and Radde both record the otter from our region under the name *L. vulgaris*, while I have seen numerous skins on sale in the fur shops of the larger Manchurian towns, indicating that the animal is fairly common. As evidence in favour of identifying the otter of the Manchurian region with that of Europe, Mr. Oldfield Thomas may be cited (P.Z.S., 1889, p. 192) as having pronounced the name *Lutra chinensis*, Gray (1837), a synonym of *L. vulgaris*. Incidentally it may be pointed out that *L. cinerea*, Ill., refers to the South China otter.

So well known an animal as the otter needs no description but it may be stated that from my experience the Manchurian otter has a slightly more greyish pelt than the European form.

Manchuria is eminently suited to the requirements of the otter, the whole country abounding in clear streams full of fish. The natives trap this animal in gins of foreign make, which they purchase in the large towns.

The Chinese name for the otter is *Shui Ta*.

While on the subject of otters mention should be made of what may be popularly called Pallas' otter. The great explorer described what appears to be some remarkable form of otter that inhabits the shores of the Okhotsk Sea. It was described as a small very dark or black form, with a short tail. The measurements given were: head and body 19″ 3‴; tail 5″. Originally described under the name *Viverra aterrima* (Pall., Zoogr. Rosso-Asiatica, Vol. I. p. 81, 1811.) as from the area between the Uth and Amur Rivers, and in form as between the mink and the common otter, this remarkable creature was also recorded by Middendorff (Sib. Reis., Z, p. 70, 1853) from the Okhotsk coast, while Schrenck mentions it, though apparently he did not secure it.

This small marine form has remained a puzzle to zoologists ever since, though some have thought it to represent the American *Lutra paranensis*, Rengg. Troussart gives its range as Kamschatka?, Alaska, West Canada, and West America to California.

Pallas gives its habitat as "the sea and neighbouring rivers of Eastern Siberia." Whatever it is it probably occurs at the mouth of the Amur at least, and so should find a place in our list.

47. Sea-Otter.

Latax lutris, L.

Latax lutris, L., Syst. Nat. I, 1766, p. 66.

Schrenck records the sea-otter under the name *Enhydris marina*, Schreb, as occurring in or near the mouth of the Amur. It also occurs along the Manchurian Coast, and is well known from Kamschatka, southward all along the Kuril Islands, where Captain Snow records it under the same name as that used by Schrenck. The former has a good account of this animal and its habits in the appendix of his book "Notes on the Kuril Islands." He also has a good deal to say about the hunting of it, chiefly by the Japanese. This was in the year 1873. Since then this valuable animal has become exceedingly rare where once it was said to be abundant.

The sea-otter is a large animal, something like its distant cousin the otter, but having a much shorter tail and very large webbed hind feet. It is of a dark grey of blackish colour, lighter on the head, the soft, thick fur being sprinkled with white hairs.

The pelt is of great value, a good specimen fetching over £200 on the London market. This has led to a great persecution of the animal in all its known haunts till now it is almost extinct. It is now protected in American waters by the government of that country. Its range extended all along the coast, both east and west, of the Northern Pacific.

Its food consists of sea-urchins, crustaceans, clams and other marine molluscs, the two former being found in great quantities on the thick beds of seaweed, or kelp, that occur in its haunts, the latter being brought up from the sea-bed itself.

The animal is capable of staying under water for a considerable length of time. It is hunted by the natives in their little canoes, and by Europeans with the rifle.

CHAPTER VII.

The Walrus, Fur-seals, and Hair-seals.

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The Walrus, Fur-seals, and Hair-seals.

Sub-order PINNIPEDIA.

No account of the carnivores of the Manchurian Region can be considered complete without mention of the various species of seals and related marine forms that occur off the coasts of Primorskaya, round the Kuril Islands and Saghalin, in the mouth of the Amur, and on into the Sea of Okhotsk, all of which waters must be considered as belonging to the general region with which this book has to deal.

From time to time seals of various species are seen off the China Coasts, and those of neighbouring regions, but it is not till we get into the more northerly latitudes that they become at all numerous.

Swinhoe refers to sea-lions being seen off the mouth of the Yang-tzu, and suggests that they probably belong to the species *Otaria stelleri*, recorded from South Japan; while Schrenck records the northern sea-bear (*O. ursina*), as well as several other marine mammals, such as the walrus, (to which he assigns the name *Trichechus rosmarius*, L.), and the smaller seals, *Phoca nummularis*, Schlegel, *P. barbata*, Müll., *P. ochotensis*, Pall.. and the ribbon seal, (*P. equestris*, Pall.), more commonly known as *P. fasciata*, Zimm. Pallas, who reached the Sea of Okhotsk in his great exploration of Siberia, described *P. largha** from the mouth of the Amur, and *P. ochotensis* from the Okhotsk Sea as new species.

Captain H. J. Snow states, in his "Notes on the Kuril Islands," that both *Otaria ursina* and *O. stelleri*, the latter in great numbers, occur along these islands; while he saw, also, what he took to be the black sea lion (*O. gillespii*, M'Bain). He further gives *Phoca vitulina* as common on the Kurils, and mentions the fact that a little grey seal, which he calls *floe rat*, drifts down the Kurils from the Sea of Okhotsk. Of these the former probably represent Pallas' *P. ochotensis* and Allen's subspecies *P. o. macrodens*, while the

*Zoo. Rosso.—Asiat. I. p. 118.

latter may be the seal that Pallas called *P. largha* (suppressed by Allen), or that described by Allen as *P.* (*Pusa*) *hispida gichigensis*.

Adams records sea bears off Dagelet Island, and also says that common seals (*Phoca*) were quite common in these regions. This writer describes an interesting phenomenon in regard to the seals of this region. He says that in Aniwa Bay, Saghalin, to the north of Cape Notoro, is a spot where, apparently, the old seals come to die. "From the quantity of bones strewn about the place, I think this must be the chief cemetery of these poor animals."

From these records it will be seen that this class of mammal is abundant in the region, nor, when we consider how much the natives depend upon them for food and clothing, can we consider them of anything but the greatest importance.

Family TRICHECHIDÆ (or *Odobænidæ*).

There are two known species of walrus, one of which belongs to the North Atlantic, and the other to the North Pacific. These are *Obodenus rosmarus*, L. and *O. obesus*, Illig. With the former we have nothing to do as it keeps to the coast of Greenland, but the latter, whose summer home is the Arctic, migrates in the autumn, and following the North-east coasts of Siberia reaches as far south as the mouth of the Amur, and Saghalin, where it spends the winter. It thus comes within the scope of our region, and so may be included in the mammals of the Manchurian Region.

48. PACIFIC WALRUS.

Obodenus obesus, (Illig).

Trichechus obesus, Illig., Abhandl. Berl. Akad. (1804-11), 1815, p. 64, 70 and 75.

Schrenck's record of the walrus occurring at the mouth of the Amur is borne out by the statement of Captain Snow that one of these animals was taken near Hakkodate in the Tsugaru Strait, though he appeared to consider it a straggler. There is a large walrus hunting industry carried on in these regions by the Japanese for the sake of the tusk, which is called ivory and is extensively carved into ornaments in Japan. The hides, also, and the blubber are valuable, and it seems probable that ere long these animals will share the fate of many others in these regions and become extinct.

This species is distinguished from the Atlantic walrus by its greater size, different outline to the head, and longer tusks, which are convergent, sometimes even crossing, and descend vertically instead of being incurved.

Family Otariidæ.

The family *Otariidæ* is represented in these regions by three distinct species, of which two are sea-lions and one is the sea-bear or fur-seal, whose valuable pelt has been the cause of bringing it to the verge of extinction. These animals go in for a certain amount of migration, breeding in the northern areas during the summer, and ranging southward in winter as far as Northern California in the east and Southern Japan in the west.

49. Steller's Sea-lion.

Eumetopias jubata, Forster.

Eumetopias jubata, Foister, 1775, and Desm. Mam., 1820, p. 248.

Otaria stellerii, Lesson, Dict. Class. Hist. Nat. XIII, 1828, p. 420.

Recorded by Snow under the name of *Otaria stelleri*, Steller's sea-lion occurs plentifully on the Kuril Islands, Saghalin Island, and elsewhere in the North Pacific. It is a large member of the eared-seal group, and should be familiar to most people. The male far exceeds the female in size, and in common with its kind is a savage fighter during the breeding season. The breeding grounds appear to be on the chain of islands that commence with Saghalin at the mouth of the Amur and extend in the Kurils to Kamschatka and on in the Aleutians to the Alaskan Coast. In winter the sea-lions migrate southward and have been recorded by Swinhoe as far south as the mouth of the Yang-tzu (lat. 32. N.) in the Western Pacific, and by others off Northern California in the east. Of a brown colour Steller's sea-lion is the largest of the group to which it belongs, the adult male weighing as much 1500 lbs.

The pelt is of comparatively little value, and the animal enjoys considerable immunity from persecution on this account.

50. Black Sea-lion.

Eumetopias gillespii, (M'Bain).

Otaria gillespii, M'Bain, Proc. Edinb. Roy. Soc. 1, 1858.

On the authority of Captian Snow I give the occurrence of this seal on the Kuril Islands. It differs from Steller's sea-lion in being of a very much darker colour.

It is neeessary to note that Pallas rcoords a member of this genus from these regions under the specific name of *nigra* (Zoogr. I, 1831, p. 107), his description being based on a juvenile specimen. As the young of Steller's sea-lion are very dark it appears doubtful whether he had a young one of this latter species or a genuine speeimen of the darker form.

Snow says that the blaek sea-lion occupies the same places as its larger relative, just described.

51. Kuril Island Fur-seal.

Callorhinus curilensis, Jordan and Clark.

Callorhinus curilensis, Jordan and Clark, The fur seals and the fur-seal islands of the North Pacific Ocean, part 3, p. 3, 1899.

Captain Snow refers to the discovery by himself of a fur-seal in the Kurils in 1881. This was subsequently described as a distinct form by Jordan and Clark.

It is elosely related to the Alaskan fur-seal. (*Callorhinus alascanus*), whieh oeeupies the eastern side of the Pacific. The Kuril fur-seal ranges up and down the Western Paeific coasts, but how far south it goes is not yet determined. It is said to occur off Chefoo (North Shantung) and Shanghai. Schrenck recorded *Otaria ursina* from the Amur, and Adams the sea-bear off Dagelet Island.

The type locality of the species is Robbin Island. This valuable animal has been hunted almost to extinetion by the Russians and Japanese.

Family Phocidæ.

In dealing with the hair-seals, which oeeur off the coasts of Manchuria, the Primorsk, and neighbouring districts, we find that considerable confusion occurs, owing to the multiplieity of names used by the various explorers and naturalists that have visited these regions. More especially were the earlier explorers guilty in this respect, and so vague were their descriptions and the localities they mentioned (or failed to mention), that it is almost impossible to assign the names they used to the speeies known to occur at the present time. Pallas described and rcoorded a number of speeies of hair-seal from the Amur and the Sea of Okhotsk, while Schrenck recorded several from the Amur.

Much more recently Dr. A. J. Allen, writing in the *Bulletin of the American Museum of Natural History, Vol. XVI, 1902,* has made a very successful attempt to clear up these difficulties, in doing which he has shown the invalidity of many of the names used, at the same time confirming others or adding new ones of his own.

Thus he says that Pallas' *Phoca largha*, which has been somewhat indescriminately used for the spotted seals of the North Pacific, is unidentifiable with any of the known forms in these parts, and therefore is not available for any of the species to which it has been applied. On the other hand he says that Pallas' *P. ochotensis* (Zoog. Rosso-Asiat. I, 1811, p. 117) is definite enough to be applied to the larger spotted seal of the Okhotsk Sea. Again he points out that Temminck's *P. nummularis*—which, by the way, was used by Schrenck for the seal occupying the mouth of the Amur, and which he thought Pallas meant when he described *P. largha*, a fact not mentioned by Allen—cannot apply to any of the seals in the regions under discussion, having, from the author's description of it, "features which may characterize a species of seal found in Japan, and still practically unknown, certainly not known to occur elsewhere." Allen also strikes out the name *P. antarcticus*, Peale, as the specimen on which this name was based agrees with *P. vitulina* of the Atlantic, and not with any of the Pacific seals, and also as there is considerable doubt attached to the origin of that specimen. The name *Halicyon richardii*, Gray (*P.Z.S., 1864, pp. 28-31, figs. 1 and 4*) he definitely assigns to the Vancouver Island seal. It may be pointed out that the Giliak name for the common seals of these parts is *langerr*, while many writers have recorded these animals under the name *Phoca vitulina*, the common seal of the North Atlantic. It is probable that Pallas derived his name *largha* from the Giliak name. If, then, that authority's name *ochotensis* refers to the larger of the two spotted seals, his *largha* can only refer to the smaller, described by Allen as a subspecies of *ochotensis* under the name *P. o. macrodens*. Failing the existence of more definite proof of the identity of Pallas' *largha*, it seems best to let Allen's name stand. Both forms may be but subspecies of *P. vitulina*.

Thus we have some five species and subspecies of hair seal known to occur along the Manchurian and Primorsk Coasts, in the estuary and mouth of the Amur, round Saghalin Island, in the Sea of Okhotsk, and along the Kuril Islands.

These are:

1. *Phoca ochotensis*, Pallas.
2. *Phoca ochotensis macrodens*, Allen.
3. *Phoca* (*Pusa*) *hispida gichigensis*, Allen.
4. *Erignathus barbatus*, (Fabricus).
5. *Histriophoca fasciata*, (Zimmerman).

52. Pallas' Spotted Seal.

Phoca ochotensis, Pallas.

Phoca ochotensis, Pallas, Zoog. Rosso-Asiat., I, 1811, p. 117.

This seal, which was described by Pallas from the Sea of Okhotsk is, as already stated, the larger of the two spotted seals, which occur in this and neighbouring regions. It is more slender in form than the other seals of these regions. Schrenck records this species.

Snow mentions the harbour seal, or leopard seal, (*Phoca vitulina*) as being very common along the Kurils, but in this he is obviously wrong, for this region is altogether out of the range of that animal. It is almost certain that the animals he saw belonged to the present species.

P. ochotensis may be considered as the common seal of these parts, taking the place here of the common seal of the Atlantic. It may easily be recognized by its general greyish colour, covered closely with rather ill-defined spots of a darker colour.

Dr. Allen records a skeleton, which was secured by Dr. Berthold Laufer at the mouth of the Amur.

53. Long-toothed Spotted Seal.

Phoca ochotensis macrodens, Allen.

Phoca ochotensis macrodens, Allen, Bull. Am. Mus. Nat. Hist., Vol. XVI, 1902, pp. 483-485.

What may be called the long-toothed spotted seal is the smaller of the two forms occurring in and round the mouth of the Amur, in the Sea of Okhotsk, and along the Kurils. It was described by Allen in 1902, as a subspecies of Pallas' *Phoca ochotensis*, from which it differs in its much heavier dentition, and in having the teeth less separated. The description was based on the skull of an old male from Kamschatka. No external characters are given. It is possible that the little *floe rat*, mentioned by Snow as appearing on the ice floating down from the Sea of Okhotsk along the Kurils, was none other than this subspecies.

54. Ringed Seal.

Phoca hispida gichigensis, Allen.

Phoca (Pusa) hispida gichigensis, Allen, Bull. Am. Mus. Nat. Hist., Vol. XVI, 1902, pp. 478-480.

Occurring in the Sea of Okhotsk, and therefore probably along the Kurils, and at least round the mouth of the Amur, if not further south along the coast, this seal is a southern subspecies of *Phoca hispida* of the Bering Sea and Arctic Ocean, from which it differs in being smaller and in having weaker dentition. Allen in describing a skin that had been kept for a couple of years says: "Upper surface is yellowish brown, the sides and back inconspicuously marbled with dark brown, or blackish; the spots are irregular in size and shape, and are often confluent. Ventral surface yellowish white without spots." It is possible that the yellowish colour herein described was due to the age of the skin.

55. Banded, or Ribbon Seal.

Histriophoca fasciata, (Zimmermann).

Phoca fasciata, Zimmermann, Geog. Gesch., III, p. 277, 1783.

Recorded by Schrenck from the Amur under the name given to the form by Pallas, *Phoca equestris*,* this handsome seal is extremely uncommon. Allen records a skin secured by Dr. Laufer on the Lower Amur River. It is known to occur along the Aleutian Islands, on the coasts of Alaska, along the Kurils, and in the Sea of Okhotsk.

It is of a brown colour with a pale cream-coloured band round the neck, one on either side of the body round the flipper, and one completely encircling the latter part of the body. It is rather a large seal, measuring some five to six feet in length.

56. Bearded Seal.

Erignathus barbata, (Fabricus).

Phoca barbata, Fabricus in Muller's Zool. Dan. Prod., 1776, VIII.

According to Allen this seal from the Okhotsk Sea is identical with that from Greenland, its range being circumpolar. He records it from Gichiga at the mouth of the Anadyr River, and says it is

*Zoog. Ross.—Asiat. I, 1811, p. 111.

"a common winter resident in Okhotsk Sea and along the eastern coast of Siberia from Petropavlovsk to East Cape, and probably along the whole northern coast." It is a large seal, measuring from six to eight feet, and is of a uniform dull yellowish-brown colour. Its skull is convex in outline, while its teeth are comparatively small and weak. It is further distinguished by its broad muzzle, and the fact that the third digit in its front flipper is the longest, instead of the first, as in all the foregoing species.

Schrenck records it from the Amur region.

CHAPTER VIII.

Whales and Dolphins.

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Whales and Dolphins.

Order CETACEA.

The present chapter deals with such large marine mammals as the whales and dolphins that have been recorded in the vicinity of the mouth of the Amur, in the Japanese Sea, in the Sea of Okhotsk, and along the Kuril Islands.

The subject is not altogether an easy one for the reason that so much confusion exists in regard to the correct names that should be applied to the various species that have been recorded by different observers. However, a careful survey of the literature upon the natural history of these parts helps us to determine the occurrence, actually recorded or probable, of a number of forms, and these are given here in order to make complete our survey of the Mammalia of this general region.

The authorities who have recorded marine forms from this region are Pallas, Schrenck, Adams, Snow, and Allen, the last quoting Buxton, while Cope, working in conjunction with Captain Scammon, may be quoted as the chief authority to whom are due most of the names here used for the Cetaceans of the North Pacific, and therefore of our region.

From the works of these observers we may safely include the following species of whales and dolphins in our list:—

1. The Pacific "right" whale, *Balæna mysticeti roysi*, Cope and Scammon.
2. The Japanese Black "right" whale, *Eubalæna glacialis japonica*, Gray.
3. The grey whale, *Rhachianectes glaucus*, Cope.
4. The North Pacific hump-back whale, *Megaptera versabilis*, Cope.
5. The Pacific sulphur-bottom whale, *Balænoptera sibbaldi sulferus*, Cope.
6. Scammon's pilot whale, *Globiocephalus scammoni*, Cope.

7. The North Pacific killer, *Orca ater*, Cope.

8. The belgua, or white whale, *Delphinapterus leucas*, Pallas.

Besides these there are some forms of dolphin and porpoise, which have been seen but not identified, while Barratt-Hamilton (*P.Z.S., 1897, p. 267*) states that sperm whales (*Physeter*) occur in the North Pacific, so that it is possible that this species also belongs to our region.

The above list is probably far from complete, but it is the best that can be made out from the records that are at present available.

The whales and their relations form an interesting group of marine mammals that have apparently descended through a line of carnivorous land animals from some small tree-inhabiting insectivore. As a group they are of considerable value to mankind, and so have long attracted considerable attention, which fact makes it all the more surprising that they are not better known than they are. The distribution of many forms, as well as their true status are not yet properly understood, and there is still need for a considerable amount of work to be done upon this interesting branch of mammals.

As a group they are divisible into two sub-orders, namely, (1) the *Mystacoceti*, or whales in which the jaws are lined with plates of the horny substance known as baleen, or "whalebone," and in which there are no true teeth, and (2) the *Odontoceti*, or toothed whales, in which the jaws are provided with true teeth, and there is no baleen.

Sub-order MYSTACOCETI.

Belonging to this suborder there are some five species which can be included safely in our list. They represent as many genera. The distinguishing features are given as each species is dealt with. It is probable, however, that more than one species of fin-back whale, or rorqual, occurs in our region.

57. PACIFIC "RIGHT" WHALE.

Balæna mysticetus roysi, Cope and Scammon.

Balæna mysticetus roysi, Cope and Scammon, Proc. Acad. Nat. Sci. Phil., 1869, fig. p. 56.

The "right" whales are distinguishable from other known forms of these great marine mammals by their proportionately large and deep heads, large mouths armed with long, slender and elastic

"baleen," or whale-bone, thick bodies, and the absence of any dorsal fin or hump. The true "right" whales are circumpolar, or at least northern in their range, and are not to be confused with the black "right" whales, which have considerably smaller heads and jaws, and are to be found in more southerly regions.

Our present form differs from its congener, the Greenland "right" whale (*Balæna mysticetus*), of which it is only a subspecies, in certain cranial characters, its skull being figured by Cope in his paper in the *Proceedings of the Academy of Science of Philadelphia.*

There are several instances of the recording of the "right" whale in or near the Sea of Okhotsk, and in the absence of any proof to the contrary it may be presumed that our present form was the creature seen, especially as the Japanese black "right" whale is more an inhabitant of Japanese waters.

58. Japanese Black "Right" Whale.

Eubalæna glacialis japonica (Gray.)

This is a subspecies of the Atlantic black "right" whale (*Eubalæna glacialis*), of which *E. australis* of the South Atlantic is often considered to be another subspecies. As already indicated, these whales have much smaller heads than the true "right" whales, as well as proportionately longer bodies. Their baleen, or whale-bone, is less valuable owing to its being shorter.

Captain Snow records this species as occurring off the Kuril Islands, while it is known to be plentiful round the coasts of Japan. Schrenck recorded it under the name *B. australis*, Desm. from the region of the Amur mouth.

59. Grey Whale.

Rhachianectes glaucus (Cope.)

Agaphelus glaucus, Cope, Proc. Acad. Nat. Sci. Phil., 1868, p. 225.

The grey whale may easily be recognized by the trained observer on account of the absence of any dorsal fin or hump, in which it differs from the rorquals and humpback whales, and by the small, flat head, and long, slender body, in which it differs from the 'right' whales. Attaining a length of from 40 ft. to 50 ft., this whale varies in colour from a mottled grey

to nearly black. The baleen is light in colour, coarse-grained, and short. Cope, who described this very distinct species, gave as its habitat the North Pacific. It has been recorded from off the Kurils by Snow. Captain Scammon's account of it states that it is remarkable in that it often frequents very shallow water, and off-shore shoals; indeed, one specimen was seen in not more than three feet of water disporting itself with seeming delight in the surf.

J. D. Caton in the "American Naturalist," 1888, pp. 504-514, gives an interesting account of the grey-back whale. He says it migrates in the true sense of the word, ranging from Cape St. Lucas at the southern extremity of the peninsula of California to Bering Sea, even entering the Arctic Sea. Though far from pugnacious where its own species is concerned, it fights fiercely and savagely when attacked by man, especially in the case of the cow in defence of its calf. Its inshore-frequenting habit makes it a possible prey to the natives of the North Pacific coasts with their primitive weapons. Breeding takes place in the shallow and sheltered bays of the Californian Coast, where the young are born after a period of twelve months gestation.

60. North Pacific Hump-back Whale.

Megaptera versabilis, Cope.

Megaptera versabilis, Cope, Proc. Acad. Nat. Sci. Phil., 1869, pp. 15 and 16.

The hump-back whales may be distinguished by their enormous flippers and flukes, especially by the former, which are often white in colour, and have the anterior edge scalloped, caused by cartilaginous protuberances from the joints of the digital bones. The flukes also have the posterior edge scalloped. The genus is further characterized by the dorsal 'fin' being rounded and long from front to back, which gives these whales the name of hump-back, and distinguishes them from the rorquals in which the 'fin' is pointed, taller and more narrow from back to front. The head is smaller than in the right whales, and not so deep. The baleen is short and coarse. These whales range in length from 45 ft. to 50 ft.

The species inhabiting our region was described by Cope as having the flippers intermediate in length between those of *M. longimana* and species with shorter flippers, such as *M. osphyia*, and *M. kuzia*. It is entirely black on the under surface, in which it differs from other forms, which have white patches.

The hump-back whales are apparently very sportive, and are often seen rolling about, leaping and diving in play. They have a habit of lying on one side with one enormous flipper standing erect in the air.

Schrenck records this whale from off the Amur Coast under the name of *Balœnoptera longimana*, Rudolphi; while Snow mentions it under its proper name of *Megaptera versabilis* as occurring off the Kuril Islands. The species is also known under the specific names of *boöps* and *nodosa*, and it is very difficult to determine just what is its correct name.

Allen also records the hump-back whale as being seen by Buxton in the Sea of Okhotsk.

61. North Pacific Sulphur-bottom Whale.

Balœnoptera sibbaldii sulferus (Cope.)

Sibbaldius sulferus, Cope, Proc. Acad. Nat. Sci. Phil., 1869, p. 20.

This species of whale is included in our list on the authority of Captain Snow, who records it off the coasts of the Kuril Islands. It was described by Cope as inhabiting the Pacific Ocean up to the Bering Sea and the coasts of Alaska.

It is, perhaps, the largest known animal, as its describer gave as its length 80 ft. to 90 ft., which makes it a few feet longer than the great blue rorqual (*Balœnoptera sibbaldii*, or *musculus*) of the Atlantic, whose length is given as from 80 ft. to 85 ft.

It belongs to the same genus as the true rorquals in that it has the high and pointed dorsal fin, small, flat head, long, slender body, and grooves on the chin and throat.

In colour it is pale grey or brown above and sulphur yellow beneath, which distinguishes it from other rorquals, which are black above and white below. The baleen is short and coarse-grained.

Whether this is the ' fin back,' mentioned by Allen as occurring in the Sea of Okhotsk, or whether one or more species of true rorqual occur in these regions, does not appear certain, though the latter alternative is probably the case. Cope describes a rorqual from the Pacific (*B. velifera*, Cope, *Proc. Acad. Nat. Sci. Phil., 1869, p. 16*), which he says may be distinguished at once from all other species by its 'baleen' being of a light lead colour, streaked

with black, and which differs from *B. arctica* in that the brown upper surface shades into the white of the belly instead of being spotted on the sides. *B. arctica* is one of the numerous synonyms of the Sei whale or Rudolphi's rorqual (*B. borealis*), and it is not easy to determine to what species he was referring. The common rorqual (*B. physalus*, L.) ranges throughout the Atlantic, Indian and Pacific oceans, and probably occurs in our district, but I have been unable to discover any definite records to this effect.

Sub-order Odontoceti.

While it has been possible definitely to ascertain the names of but three of the members of this suborder that occur in our region, there are undoubtedly others. For the present, however, the matter must be left as it is, merely mentioning the fact that some form or forms of smaller cetaceans, such as dolphins and porpoises, have been recorded, though without any specific names being given.

62. Scammon's Pilot-Whale.

Globiocephalus scammonii, Cope.

Globiocephalus scammonii, Cope, Proc. Acad. Nat. Sci. Phil., 1869, p. 21.

Leaving the 'baleen' whales, and coming to the smaller 'toothed' species, we find records of a few forms, though, with these the observers seem less definite even than with the larger whales.

First to be mentioned is the black fish, or pilot-whale, to which the generic name of *Globiocephalus* has been given. The members of this genus may be recognized by their black colour and peculiarly globe-like heads, in which the forehead protrudes anteriorly beyond the mouth, the latter having only the least suggestion of being beak-shaped. The length is from 18 ft. to 20 ft.

There are several species of black fish, but we have a definite record of Cope's *G. scammonii* from the Kuril Islands by Captain Snow. This is the Pacific representative of the genus, and is entirely black, and more slender in form than *G. melas* of the Atlantic.

Cope states that it has no white band or other mark on the abdomen and is among those most uniformly black. In comparing it with other species described from its habitat, he says that *G. chinensis* probably does not belong to this genus, while the name *G. sieboldii*, being unaccompanied by a description is invalid. Blyth's *G. indicus* shows a wider pectoral fin, or flipper, a longer and lower dorsal fin and considerably wider flukes.

The pilot whales owe their name to the fact that they go about in large herds, or schools, led by one or two old bulls. They have a habit of entering shallow bays, where they not infrequently get stranded, many of them perishing miserably. In Scotland they are called ca'ing (=calling) whales.

63. North Pacific Killer Whale.

Orca ater, Cope.

Orca ater, Cope, Proc. Acad. Nat. Sci. Phil., 1869, p. 22.

Both Snow and Allen record some form of killer whale, or grampus, from the seas of the region under discussion, the former from off the Kurils, the latter from the Okhotsk Sea, and since Cope has described a species of killer (*Orca ater*), whose habitat he gives as from the North-west coast of Oregon to the Aleutian Islands, we are probably safe in the use of this name for the killer of the North-western Pacific.

The killers as a group are well known. They may readily be distinguished from the black fish by the more pointed head, and from the false killer (*Pseudorca*) by the conspicuous white patch behind the eye and the cream or brown crescent behind the dorsal fin, the false killer being entirely black. In length they run from 20 ft. to 25 ft.

The North Pacific killer has the body black above, whitish underneath, with a large white spot behind the eye, and a brown crescent behind the dorsal fin. It differs from *O. rectipinna* Cope, which ranges from California southward, in having a less acuminate muzzle, and the dorsal fin, which is enormous, at a slope, instead of at right angles to the axis of the body, and in the presence of the white patch behind the eye, which is absent in *rectipinna*.

It is not to be confused with *Orca orca* of the Atlantic in which the crescent shaped patch behind the dorsal fin is much lighter in colour.

The habits of these voracius whales in attacking and killing even the largest of the baleen whales are too well known to need more than a passing notice. They hunt in packs or shoals, and do great damage to the fur-sealing industry by attacking and devouring large numbers of seals during the migrations. The observations and photographs taken by recent Antarctic epxlorers have taught us much about these wolves of the sea, whose relentless ferocity make them the terror of the deep.

64. White Whale, or Beluga.

Delphinapterus leucas, Pallas.

Delphinapterus leucas, Pallas, Zoogr. Rosso-Asiat., I, p 274.

First described by the famous explorer and naturalist, Pallas, from the Okhotsk Sea, the white whale or beluga (*Delphinapterus leucas*) has since been recorded by Schrenck from the Amur, and by Allen, quoting Buxton, as being abundant in the Okhotsk Sea. It has also been recorded as occurring off the Scottish Coast, but it is chiefly circumpolar in its range, being found mainly in the Arctic Ocean.

Of a uniform creamy white colour the beluga is most nearly akin to the narwhal, but lacks the long spiral ivory tusks of the latter. The length is about 20 ft. in full grown males.

This whale is known to ascend the estuaries of rivers in pursuit of its food, which consists mainly of fish. It is assiduously pursued by the natives along the coasts, both east and west, of the North Pacific and the arctic regions. When the ice breaks up in the Amur in late spring, this species ascends that river hundred of miles.

Dolphins and Porpoises.

Adams describes the finding at Aniwa Bay, Saghalin, of skulls of two species of true dolphins, which is the only record of dolphins in these parts. Snow states that there are three porpoises that occur off the Kuril Islands, but he makes no guess at the species.

These records are sufficient to show that some form or forms of the smaller *Cetaceæ* occur in these regions.

Note :—Since the above was written, I have come across a publication, which throws much light on the subject of the whales that occur in our region.

Roy Chapman Andrews in his book "Whale Hunting with Gun and Camera" (1916) describes the whaling industry of Japan, the main centres of which appear to be at Oshima and Aikawa on the south and north-west coasts, respectively, of that island. In the latter place he found the sei whale, or Rudolph's rorqual, *Balænoptera borealis* (Lesson), one of the main supports of the industry, and he states that though this industry had been going on for the past fifteen years, science up to the time of his visit (1909) knew nothing of the existence of this whale in the Pacific. It is probable, however, that the existence of some such whale *was* known, but that it had not been identified with the sei whale. He also saw a large whale which he called the blue whale or sulphur-bottom, *B. musculus* (Linn.), as well as a smaller form which he called the finback or razor-

back, *B. physalus* (Linn.), taken at the station. The latter is, of course, the common rorqual of British authors, to which Lydekker gives the name *B. musculus*, while the former is either the great blue rorqual (*B. sibbaldi*) or its Pacific representative, the "sulphur-bottom", to which the subspecific name of *sulfurus* may be given. Andrews concludes from his examination of the whales generally that many of them, including the "right" whale, the black "right" whale, the hump-back, the blue whale, the fin-back, and the sei whale, are cosmopolitan in their distribution, and actually migrate from sea to sea, and ocean to ocean, so that the specimens of each species found in both the Pacific and Atlantic are indistinguishable.

If this be the case then the species recorded here as occurring in our region should be classically named as follows:

1. *Balæna mysticeti* (Linn.)
2. *Eubalæna glacialis* (Bonn.)
3. *Rhachianectes glaucus* (Cope.)
4. *Megaptera nodosa* (Bonn.)
5. *Balænoptera sibbaldi* (or *musculus* of Linnæus.)

From Anderson's observations it appears necessary to add the sei whale (*Balænoptera borealis*=*B. velifera* of Cope) and the common rorqual (*B. physalus*) to our list of whales to be found off the coasts of the Manchurian Region, since it is certain that if they occur off the north-west coast of Japan in the Japan Sea, they must also be found off the Primorsk Coast, as they are not particular about the temperature of the water they live in. Though the sperm whale (*Physeter macrocephalus*) is also taken at Aikawa, according to Andrews, the same authority states definitely that it keeps to *warm* currents. It, therefore, cannot occur in our region, the shores of which are washed by a cold current coming down from the cold Okhotsk Sea.

Andrews also describes the re-discovery of the so-called grey whale (*Rhachianectes glaucus*) off the coasts of Corea, where, at a place called Ulsan on the west coast, specimens of this whale are captured in considerable numbers as they pass southward to the southern end of the Peninsula to breed. He considers the Corean form to be identical with that from the eastern side of the Pacific, though he says that it does not agree with Cope's description of the latter. This whale apparently migrates between South Corean waters and the Okhotsk and Bering Seas.

CHAPTER IX.

The Deer of the Manchurian Region.

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Order UNGULATA.

Family Cervidæ.

Up to within comparatively recent times the forests of the Manchurian Region have been the home of large numbers of deer, and even today there are many places where the roe is extremely common, and the wapiti fairly so. Here, too, the sika, that most beautiful of all the eastern deer, still survives the unsparing persecution to which it is, and has been for long, subjected.

Besides these three species, there is the musk-deer, also an inhabitant of the forested areas, the moose and the reindeer. The natives have spoken to me of the presence of what they call *Chang-tzu*, which is the Chinese name for the little Yang-tzu river-deer, and I have also been assured by European sportsmen who travelled in Heilungkiang that a species of muntjac occurs there. I have never come across tangible evidence of the occurrence of either of these forms in Manchuria and neighbouring regions, except that a river-deer, *Hydropotes coreanus*, David, occurs in Corea and adjacent islands, and I am rather inclined to the view that in both cases the roe, or possibly even the musk-deer, were mistaken for the animals reported. However, as it is just possible that both these forms occur, that is to say the river-deer and muntjac, it is best to preserve an open mind on the subject, till such time as the question can be settled one way or the other.

Including the two forms of sika, we thus have some seven species of deer that can definitely be said to occur in the Manchurian Region. These are:

1. The Manchurian Wapiti, *Cervus xanthopygus*, M.-Edw.
2. The Manchurian Sika, *Cervus mantchuricus*, Swinhoe.
3. The Ussurian sika, *Cervus dybowskii*, Taczanowski.
4. The Manchurian roe, *Capreolus mantchuricus*, Noak.
5. The Siberian musk-deer, *Moschus sibiricus*, Pallas.

6. The East-Siberian elk, or moose, *Alces machlis yakutskensis*, Millais.
7. The East-Siberian reindeer, *Rangifer phylarchus*, Hollister.

This is a good list, and, were all the species common, would make of this region a sportsman's paradise indeed, but, unfortunately, many of them are only plentiful in inaccessible regions, while at least three, the wapiti and the two sika, are on their way to extinction.

65. Manchurian Wapiti.

Cervus xanthopygus, Milne-Edwards.

Cervus xanthopygus, Milne-Edwards, Ann. Soc. Nat. VIII, 1867, p. 376, and Rech. Mamm., 1871, p. 181, pl. 21.

Since its discovery the Manchurian wapiti, which may be considered as the extreme eastern representative of the red-deer group, has been shot from time to time by sportsmen from Europe and America, so that it is comparatively well known, and has its place in Rowland Ward's "Big-Game Records."

Schrenck seems to have been one of the earliest to record this deer, though he took it to be identical with the European species, *Cervus elaphus*.

In appearance this species differs markedly from other known forms. Its chief, and most noticeable characteristic is the comparative shortness and stoutness of the horns. This is undoubtedly due to the fact that the animal is a forest-inhabiting form, where any great length of horn would be a decided disadvantage to it.

In its coloration, also, the Manchurian wapiti is distinct from the more western species. It may be described in general terms as uniformly lighter and more greyish. In its winter coat the body is greyish-brown, washed with light chestnut, which colour gets more intense on the neck and forehead. The muzzle is brown, darkening toward the tip. There is no white on the chin, though the dark patch on either side of the latter is present. The legs are grey-brown, slightly darker on the anterior surface. There is a distinct brown median dorsal line, which is very pronounced on the neck, at the same time dividing at the croup-disc, forming an edging to the latter, which is of a light chestnut colour. The tail is brown, the dark colour being separated from that of the back. The ears are light grey-brown. The summer pelage is red or chestnut.

Young Manchurian black bear (*Selenarctos ussuricus*, Heude).

Young Manchurian tiger.

Horns of the Manchurian wapiti (*Cervus xanthopygus*, M.-Edw.).

The Manchurian wapiti differs from the form found in North China in having a greater predominence of chestnut on the head, neck and legs, a lighter croup-disc, darker ears and the absence of white on the chin. The Kansu wapiti (*Cervus kansuensis*) appears to be altogether darker and browner than either the North China or Manchurian forms. Nevertheless up to the present the North China wapiti has not been described as a distinct form, indeed it seems to have been pretty well neglected by all authorities.

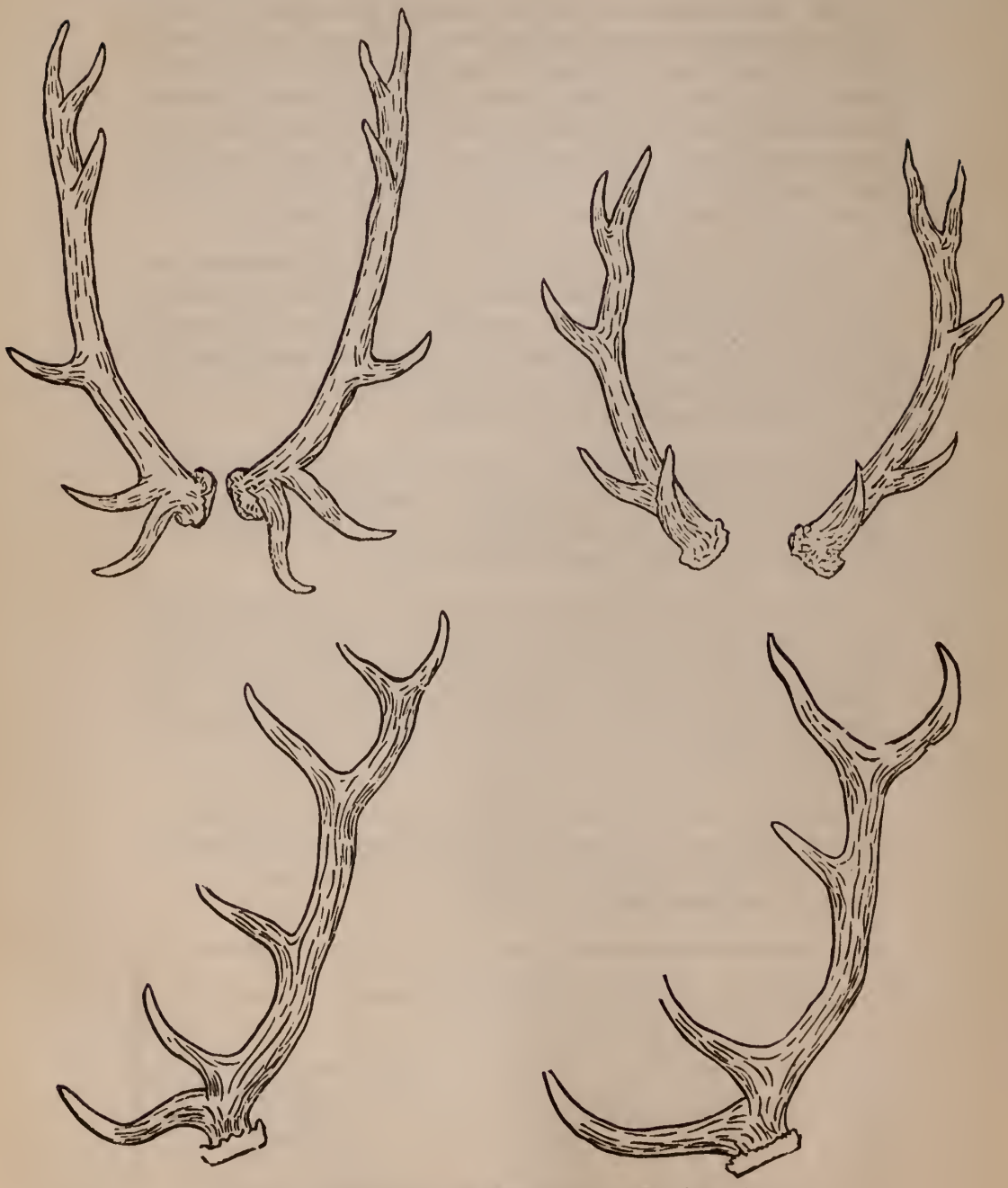
In point of size there appears to be little to choose between the three species. There are not sufficient records of body measurements to establish their relative sizes, and we must be content with saying that the Manchurian species is a good deal larger than the British red-deer, though falling considerably short of the famous North American wapiti (*Cervus canadensis*).

This comparatively large size of our species makes the shortness of the horns all the more conspicuous. Rowland Ward gives 33¼ inches as the record length, 5¾ inches as the circumference, and 21½ inches as the widest spread for this species.

The record corresponding measurements for the North China wapiti, being those of a stag shot by Captain T. Holcomb in North-west Shansi, are: length, 41 inches; circumference, 9½ inches; widest spread, 29½ inches; while the same measurements for the best Kansu wapiti are: length, 43¼ inches; circumference, 5½ inches; widest spread, 38½ inches.

While in the I-mien-p'o district I had the opportunity of running the tape over a number of wapiti horns in the possession of Mr. A. Wischniakowski and others. These arranged in order of size in tabulated form are as follows:

	No. of Points.	Length.		Circumference.		Spread.	Remarks.
		R.	L.	R.	L.		
1	6 + 6	31¼"	33"	7"	7"	28¼"	Very long brow & bez tines.
2	6 + 6	30½"	29½"	7¼"	—	23"	Tines small, beam long.
3	5 + 5	29¾"	30"	7¼"	7	—	
4	5 + 5	25"	—	7¼"	—	18"	



Types of Antlers of the Manchurian Wapiti, (*Cervus xanthophygus*, M.-Edw.)

In each of the above specimens the greatest spread was across the trez tines, which, in this species, instead of pointing forward take an outward direction from the beam. The latter from the trez tine takes a perpendicular, and, in some cases, an inward direction. I saw many stunted, bent and distorted horns, clear proof of the unfavourable effect of the forest environment upon the development of large horns.

In the Sikawei Museum, Shanghai, there are some specimens of wapiti horns from Manchuria, which I had occasion to examine and measure. The best of these were a pair from the Sungari Valley, just where is not stated on the label, which measured: length, R., 35½ inches, L., 34½ inches; circumference, 7½ inches; spread 22¾ inches. The number of points were eleven (6+5). This is easily the record length, beating Rowland Ward's record by 2¼ inches.

The range of the Manchurian wapiti is somewhat difficult to determine. It extends eastward at least to the Ussuri Valley and northward into the Amur. How far westward it extends, or just where its limit reaches those of other species is impossible to say. Heinrich Bolan* described a new species from what he called the Buriatic steppes of Northern Manchuria, as being intermediate between the red-deer and the American wapiti. Whether this is distinct from the Manchurian wapiti is impossible to saw without a comparison of specimens from both areas, but it seems improbable. He used the name *C. lühdorfi*.

In Manchuria the wapiti is to be found wherever there are forests, though it is comparatively rare in those parts that are being invaded by settlers. It is nowhere plentiful except in the most inaccessible parts of the Kirin forest, in the upper and middle basin of the Ussuri, and in the central and western parts of Heilungkiang.

Sportsmen desiring to secure a good head would be well advised to start operations from Vladivostok, whence they could tap the Ussuri, Primorskaya, and Eastern Kirin with a good chance of success. To work from the Chinese side as I did is liable to prove disappointing.

The habits of this deer differ to a certain extent from those of its congeners of other districts, owing largely to its forest environment. Lying up all day in some favourite spot, usually some valley

*Abhandl. aus dem Gebiete der Natur., Hamburg, Vol. 7, pp. 33-35. p. IV and a text fig. 1880.

bottom where the foliage is not too dense, the wapiti feeds only at night. Not till daylight has almost gone does it leave the sheltering woods and sally forth upon the swampy clearings, so characteristic of the Manchurian forests, there to feed upon the rich grass and to meet and play or fight with others of its kind, till the approach of daylight drives it back to its secluded haunt. This is during the warmer months of the year. In winter it wanders more by day, till, the snow becoming too deep for its comfort, it forms, with a number of companions, what is known as a "yard." This consists of a space beaten out in the snow, with well trodden paths ramifying from it in all directions, tapping the surrounding stores of herbage.

The bucks consort together in twos and threes, during the winter; the does and young in much larger herds, sometimes numbering a dozen or fifteen individuals. In spring the latter begin to separate, and seek seclusion, and in May or June the young are born, the progeny of each doe seldom if ever exceeding one in number.

At this time the bucks are excessively shy and retiring, as the horns are growing; but as autumn draws near the females begin to form into herds again, while the males look askance at one another. Finally the young bucks leave the full grown stags, and go off by themselves, while the latter, their full development of horn having been reached, commence their roaring. This is about the middle of September. The musical challenges go forth, awakening the echoes of the forest. Lordly stags meet and do battle for the soft-eyed hinds: the rutting season is on. Having defeated other claimants, and gathered together a small harem, the lord enjoys the privileges that he has fought for and won for about two months; then, leaving his wives, he seeks again the society of young bachelors, and so completes the annual round.

The season or horn growth agrees with those of the other related species. The horns commence growing in spring, and by the end of July have attained their full length. Then they begin to dry, and by the end of August the stag commences to rub off the velvet, for which purpose a straight, strong sapling devoid of lower branches is chosen. These saplings may be encountered throughout the forest, and with the velvet clinging to the strips of bark, and the polished exposed surface of the inner wood, bear testimony to the vigour with which they have been used.

The Manchurian wapiti, by reason of much persecution, has become very timid and difficult to approach. The natives hunt it with the gun, but more often they dig pitfalls in the paths that the animal frequents. Deer-farming has become a very profitable industry, and a live deer is worth much more than a dead one. As I have stated elsewhere, the value of a deer lies in its horns, which when in velvet fetch anything from £10 to £30 per pair at the apothecary's emporium. It has been found that the horns in velvet may be cut from the living animal without injury to it, or endangering the growth of the following year. Thus a stag which costs but little to feed brings in an annual sum that is a small fortune to the poor settler that owns it. It is on this account that the Chinese prefer to trap the deer alive.

The Russian hunters, as is their wont with other big game, resort to the use of the rifle, and depend upon their own woodcraft, and knowledge of the deer's habits and haunts, to bring them within sight and range. A favourite method is that of calling the stags with the use of a decoy whistle or bugle, with which they imitate the roaring of the wapiti, and in the rutting season can entice the amorous buck to his doom.

The roar of the Manchurian wapiti is very fine and musical. It has a distinct bugle, and sets the woods ringing with its resonance.

The Russians call this deer *Izoobra*, while the Chinese name is *Ma Lu*, or horse-deer.

66. Manchurian Sika.

Cervus mantchuricus, Swinhoe.

Cervus mantchuricus, Swinhoe, Proc. Zoo. Soc. Lond. 1864 p. 165, and 1865 p. 5.

In trying to determine the correct name for the sika that inhabit these regions we find ourselves confronted with a number to decide between. Swinhoe was the first to decribe this handsome deer, giving the name *Cervus mantchuricus* to the specimen he examined. Subsequently Taczanowski* described a species from the Primorsk, the chief point of difference being the white chin. To Heude we owe further complications in that he described two more species, one from Mukden, which he called *Sika microspilus*,†

*P.Z.S. 1876, p. 123.

†Mém. Con. l'Hist. Nat. l'Emp. Chin., Vol. IV, pt. 4, pl. 210, 1899.

and the other from the Sungari Valley, to which he gave the name *Sikelaphus imperialis.**

I examined the specimens upon which he based the descriptions of these new species of his, and compared them with specimens of what he considered to be *C. mantchuricus*, and *C. dybowskii*. The result of my comparisons, which I have given in a paper in the *P. Z. S. Lond. (April 1917, pp. 7-26)*, is that, judging from the skulls alone, which apparently is all Heude had to go upon, it is impossible to separate any of these specimens one from another, and that therefore *microspilus* and *imperialis*, at least, are only synonyms for *mantchuricus*. *C. dybowskii* apparently shows differences in colouring, upon which grounds we must recognise it as a distinct form.

The Manchurian sika is a very much larger and more handsome deer than the Japanese, Yang-tzu and more southern species. In this it agrees with the Chihli and Shansi species, *C. mandarinus*, M.-Edw. and *C. grassianus*, Heude, to which it is closely related. Indeed all these northern forms might be placed in a separate group from the other forms on account of their size. In this group a full grown stag equals, if it does not exceed, in size a full grown British red-deer stag. The horns, which are exceedingly graceful and attain a good size, conform to the elaphine type. They seldom develop more than four points, however. The record length for the Manchurian sika is 32½ inches. This comes very close to the record for the Manchurian wapiti, which is a much larger animal.

In summer the coat of the Manchurian sika is a rich rufous colour, covered on the body with large white spots arranged in irregular, roughly parallel rows. There is a dark median dorsal line. The tail is dark above, white below, and the croup-disc is white. There is a darkening of the muzzle towards the nostrils.

In winter the coat is a dark grey-brown, faint greyish spots being just discernable.

Of the habits of this species I can scarcely speak from personal experience. It is a somewhat rare animal at the present time owing to the persecution to which it has been subjected for the sake of its horns when in velvet, which are supposed by the Chinese to be better than those of the wapiti, and so fetch the highest prices. The only living specimens I have come across have been in captivity. At Hua-shu Lin-tzu on the Upper Sungari there were three or

*Mém. Con. l'Hist. Nat. l'Emp. Chin., Vol. II, pt. 3, pl. 146, 1894.

four bucks and a herd of about thirty does kept on a farm. There are many such farms scattered over Manchuria, so that it is to be hoped that the species is thus being preserved from extermination.

In North Corea a sika, whether of the same species as the Manchurian one or not I have not been able to ascertain, is said to be very plentiful, and from all accounts is on the increase. This is due to the fact that the Japanese, themselves but indifferent hunters, have forbidden the use of fire-arms and traps amongst the Coreans. This being so North Corea is bound to become a first class hunting ground, where the big game hunter may count on getting good specimens of this handsome deer, as well as the Manchurian tiger, bears, and wild pigs, not to mention roedeer and lesser game animals and birds.

The sika ranges in Manchuria from the Sungari Valley eastward to the Ussuri, beyond into the Primorsk, where it is known as *C. dybowskii*, and southward, keeping always to the forested areas, into North Corea. It occurs, apparently, in Heilungkiang Province, but not beyond the Amur River. Schrenck does not mention it as occurring in the Amur region.

If the wapiti is shy and difficult to approach the sika is infinitely more so. The pitfall is the chief means employed by natives to capture this deer, though they also resort to driving and shooting.

The Chinese name is *Mei-hua Lu*, meaning rose-blossom deer.

67. Ussurian Sika.

Cervus dybowskii, Taczanowski.

Cervus dybowskii, Taczanowski, Proc. Zoo. Soc. Lond., 1876, p. 123.

As already stated the Ussurian sika must, for the present at least, be considered as distinct from the true Manchurian form owing to certain differences of colour as given by its describer, though a comparison of skulls from the Ussuri Valley and other parts of Manchuria, which I was able to make in the Sikawei Museum at Shanghai, reveal no real distinguishing features.

Taczanowski describes this form as having a white heart-shaped spot on the anterior part of the chin, which certainly does not occur in *mantchuricus;* while from his description, which was based on winter skins, the white spots on the body would appear to be

considerably more conspicuous than in the winter pelage of *mantchuricus*, the whole coat also apparently being somewhat more red. Otherwise the two forms seem to be indistinguishable.

This form inhabits the Ussuri Valley and Primorskaya up to the coast. Just where its range meets that of *C. mantchuricus* is at present impossible to say.

My friend Mr. Jacobus, who resided in Vladivostok for some time, informs me that some of the Russians there have immense farms of these deer, which they keep for the sake of their horns, and which are allowed to roam at will over very extensive forested grounds. The number of head so kept runs into thousands.

68. Manchurian Roe.

Capreolus mantchuricus, (Noak).

Cervus pygargus mantchuricus, Noak, 'Humbolt,' Vol. VIII. p. 9, 1889.

That the roedeer inhabiting Manchuria is of the same species as that of Siberia cannot be admitted, though it is frequently referred to that species, which goes by the name of *Capreolus pygargus*. The distinguishing features of the latter animal are its great size, light colour, and comparatively small horns. In North China two species of roe have been described, namely *C. bedfordi*, Thomas, from Shansi, Chihli and Shensi, and *C. melanotis*, Miller, from Kansu. These two forms are more the size and colour of the European and British forms, but have much longer horns. *C. mantchuricus* seems to be intermediate between *C. bedfordi* and *C. pygargus*, in size, colour, and the size of its horns.

I had the opportunity of measuring two pairs of horns in the possession of Mr. A. Wischniakowski at I-mien-p'o. The best pair measured 12 inches in length, and the other $10\frac{3}{4}$ inches. These horns had been picked out from a great number secured by local hunters as being of unusual size. This does not compare well with the fine horns obtainable in North Shansi, where $17\frac{1}{2}$ inches is the record, and 11 and 12 inch horns are common.

In Manchuria the roe is the only deer that does not keep entirely to the forested areas. It is to be found in places where the forest has either long since been cut away, or else never occurred. The comparatively bare hills along the lower reaches of the Yalu River, the willow-grown swamps and flat-lands of the Lower

Young Manchurian Wapiti.

The Manchurian Roedeer (*Capreolus mantchuricus*, Noak.)

Sungari, and the foothills along the eastern edge of the Fengtien plain are all inhabited by the roe, though in recent years their numbers have markedly diminished. In the forests these little deer are still plentiful, in places positively numerous.

The habits of the Manchurian roe differ but little from those of its congeners elsewhere. It lies up most of the day, coming forth to feed in the clearings at dusk, and returning to its favourite haunt at dawn. In wet weather it may be seen about at all times of the day. The rutting reason takes place during the month of July. The young, usually two in number, having been born late in May or early in June. There seems to be no splitting up of the small herds, except that the males, while their horns are soft, sometimes seek seclusion. In Shansi I have frequently seen the buck with horns still in velvet accompanying a single doe as though already mated. Frequently the roe is to be seen in herds of from three to six individuals, but three appears to be the commonest number.

The roe is of little value beyond what can be obtained for its flesh and skin, and so is not hunted nearly so assiduously as the other deer. It is usually shot. The Chinese name is *P'ao-tzu*, or *P'ao Lu*. The Russians call it *Kazuli*.

Schrenck records this deer from the Amur under the name *Cervus capreolus*, L.

69. Siberian Musk-deer.

Moschus sibiricus, Pallas.

Moschus sibiricus, Pallas, Spicil, Zool. XIII, 1779,p. 29, pl. 4-6.

One of the least often seen of the Manchurian deer, if not the rarest, is the little musk-deer. It does not appear to have been always as uncommon as it is now, and there are certainly places where it is still sufficiently plentiful to make it worth the hunter's while to set snares for it. It is by snares that the musk is captured, and the same type of snare is used in Manchuria and neighbouring regions as is used throughout China even to the Thibetan border. A little hole is dug in a path that is known to be frequented by musk-deer, and a little wooden platform is set in this in such a way as to hold down a trigger. The trigger is attached to a noose which lies lightly round the hole, its other end being attached to a convenient sapling that is bent over and held so by the trigger.

When the musk puts its foot on the wooden platform the trigger is released, the sapling straightens, drawing tight the noose round the animal's leg and jerking the poor little creature into the air, where it hangs till death overtakes it. This is at once a brutal and wasteful method, for females and young males, which have not yet developed musk-pods, are indiscriminately caught along with the old males (over three years) which alone are of any value.

In Shansi, North China, where the musk-deer is plentiful in the forested mountainous areas, the hunters will not tolerate this method, resorting to driving and shooting; which though more arduous, and requiring more hands, yet ensures that only the males with musk-pods are taken. In view of the value of the musk-deer to the country it would be a good thing if the Chinese Government made it illegal to employ the snare in the hunting of this little animal.

Schrenck recorded the musk-deer from the Amur under the name of *Moschus moschiferus*, and Fraser describes the hunting of it by the Orotchi Tartars of the Primorsk Coast. I saw a specimen in the possession of Mr. Wischniakowski at I-mien-p'o, North Kirin, that had been shot locally, and I also heard of the existence of the animal in other parts from the Yalu to the Lower Sungari and in Heilungkiang Province. So its range may be considered as coincident with the forested areas of the whole region.

The species undoubtedly is *M. sibiricus* and not *M. moschiferus*, as it comes within the Siberian faunal-region; while *M. moschiferus* is the Himalayan form, with *M. sifanicus*, a West China and Thibetan form, between.

The Manchurian musk-deer is browner in colour than either *moschiferus* or *sifanicus* and has the markings on the neck whitish, instead of yellowish, as in *sifanicus;* absent in *moschiferus*.

About the size of a half-grown lamb, with its dainty, pointed hoofs, large, erect ears, graceful form, and sharp, gleaming white tusks, the musk is a beautiful little creature. The tusks of Mr. Wischniakowski's specimen measured 3½ inches in length. The tusks of the musk-deer are much narrower and more slender than those of the river-deer (*Hydropotes*), and do not wear in the same way. The hair of the musk is long, thick and hollow. It comes out very easily.

Of shy and retiring habits, the musk is seldom seen, and even more seldom shot, by sportsmen. That it carries, on its belly, a pouch of the valuable substance that gives it its name, is the cause of its persecution. Every man's hand is against it. The information that one has been seen in the district is the signal for every hunter to sharpen his wits and try to secure the luckless animal, and usually it is not long before it succumbs to one or other of its pursuers.

The flesh of the musk-deer is not considered very good, while the skin is too small to be of much value, though, owing to its toughness it makes excellent buck-skin leather when properly dressed.

The little animal loves rocky surroundings, and is usually to be found along rocky ridge-tops in the densest parts of the forest.

The Chinese name is *Hsiang-tzu*, *hsiang* meaning scented, odoriferous.

70. East-Siberian Elk, or Moose.

Alces machlis yakutskensis, Millais.

Alces machlis yakutskensis, Millais, The Field, Lond. Vol. 118, p. 113, July 8th, 1911.

There can be no doubt as to the occurrence of the elk or moose in the Manchurian Region, though it cannot be considered as at all pleniful. To begin with we have Schrenck's record of it from the Amur and Daurian regions, under the name of *Cervus alces*, L. Fraser states that the Orotchis of the Primorsk coast hunt the elk, though he does not attempt to classify it.

Some American sporting friends of mine, who hunted from San-sing in Heilungkiang, told me that they saw tracks that were undoubtedly those of moose; and I have also heard that this deer is to be had in the Upper Ussuri basin.

Though I cannot speak with certainty, never having seen a specimen or heard one described from these regions, it seems probable that the moose of Heilungkiang, the Amur, and Primorskaya are to be referred to Millais' subspecies *Alces machlis yakutskensis*, which was described from the Aldan River in Western Yakutsk. This region lies due north of the Amur. In describing this subspecies he says: "The whole head and neck skin of the Yakutsk elk is a very rich dark brown even round the nostrils, and this character marks it at once as being distinct from all other local

races of elk." The legs, also, are very dark from the knees to the hoofs, which part is white or light grey in other species. This deer is larger than the Scandinavian and smaller than the Alaskan forms. The horn development also appears to be better than that of the European species, though not up to the North American form.

71. East-Siberian Reindeer.

Rangifer phylarchus, Hollister.

Rangifer phylarchus, Hollister, Smithsonian Miscellaneous Collections, Vol. 56, No. 35, p. 6, 1912.

Two reindeer have been described from Siberia, one, *Rangifer tarandus sibiricus*, by Schreber* from the Berezof Mountains on the Obi River, the other, *R. phylarchus*, by Hollister from Southeastern Kamschatka, and of the two it would seem that the reindeer of the Manchurian Region belongs to the latter. This would appear to be a woodland coastal form, for it occurs, apparently all along the coast from Kamschatka to the mouth of the Amur and on southward along the Primorsk Coast.

From time to time I heard from natives of the existence of reindeer somewhere in Eastern Manchuria; they did not seem clear just where. They used the word *Ssu-pu-hsiang*, a name indiscriminately used for both the reindeer and the peculiar elaphure, or David's deer (*Elaphurus davidianus*). Incidentally I may say that to this loose use of the Chinese name *Ssu-pu-hsiang*, which means 'the four unlikes,' is due the fact that reports have frequently been brought in to the effect that David's deer still occurs in a wild state. Some years ago an attempt was made to bring a number of *Ssu-pu-hsiang* from Ili in Western Mongolia for the owner of a well known deer park in England, under the impression that they were elaphures. Of eleven animals that commenced the journey only one reached Peking alive, and it turned out to be a reindeer. It is my opinion that the elaphure does not exist anywhere in the wild state. Its original home was probably the plains of Chihli before they became settled up, where it lived in swamps covered with reeds and willows; and that as the whole of these plains were brought under cultivation the animal disappeared, with the exception of a few that were kept by the Emperors in large parks and hunting grounds.

*Säugethiere, pl. 248c, 1784.

The reindeer is used by the Tartars at the mouth of the Amur, while Fraser tells us that the Orotchis hunt this animal.

Schrenck records the reindeer under the name of *Cervus tarandus* from the Amur.

This species (*Rangifer phylarchus*) was described as being the largest of the palæarctic reindeer, exceeding *R. tarandus fennicus* of Finland in every important cranial measurement; and being very much larger than *R. t. sibiricus*, with higher brain case and smaller teeth.

CHAPTER X.

The Goral, Wild Sheep, and Antelopes.

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Family Bovidæ.

The *Bovidæ* are represented in the Manchurian Region by members of but three genera, *Urotragus*, *Ovis*, and *Gazella*, or the gorals, wild sheep, and gazelles, respectively. Beyond the domestic breeds there are none of the bovines in these regions. The distribution of these three genera of hollow-horned ruminants is very distinct, each appearing to occupy areas uninhabited by the others. The gorals are found in forested areas where there are rocky ridges and cliffs, the sheep occupy open mountainous country free from forests, and the gazelles the flat-lands on the borders of the Mongolian deserts.

The gorals of China and Manchuria, like several other branches of the East Asiatic ungulates, have been a source of considerable difficulty to naturalists in the matter of determining the true status of the various species. To begin with there is a considerable amount of variation in the individuals of any given district. Some are lighter than others; they vary in size, and in the shape and length of their horns. But this does not excuse Heude in describing and naming so many distinct species, whereby he reduced, for the time being at least, the subject of the nomenclature and classification of the Chinese gorals to a state of considerable confusion. In a paper on Heude's pigs, sika, serows and gorals (*P. Z. S. Lond. April 1917*), I made an attempt to clear up the whole subject, and having gone carefully over Heude's specimens in the Sikawei Museum, Shanghai, I was able to show that of the seventeen species, as given by Heude, not more than seven could be accepted as genuine.

Without going into further detail of the specific characteristics of these seven species I may cite them here, with the districts they occupy. They are:—

1. *Urotragus cinereus*, M.-Edw. Moupin (N. W. Ssu-chuan and neighbouring Thibet).

2. *Urotragus griseus*, M.-Edw. Moupin, and W. Ssu-chuan.
3. *Urotragus niger*, Heude. N. E. Ssu-chuan, S. Shensi, and N. W. Hupei.
4. *Urotragus henryanus*, Heude. I-chang, Central Hupei.
5. *Urotagus arnouxianus*, Heude. Chekiang.
6. *Urotragus caudatus*, M.-Edw. N. Shansi and Chihli.
7. *Urotragus raddeanus*, Heude. Manchuria.

We are concerned here only with the last, which is the form found in Manchuria, though it is possible that *U. caudatus* extends into South-eastern Fengtien. However, I have no proof of this, and so shall not include it in the fauna of the Manchurian Region.

72. Manchurian Goral.

Urotragus raddeanus, (Heude).

Kemas raddeanus Heude, Mém. Conc. l'Hist. Nat. de l'Emp. Chin., Vol. II, p. 240 pl. XXXV, 1892.

The Manchurian goral is much larger than any of its congeners from China, Thibet, the Himalayas, or Japan. In fact, it is the largest known species. In the Sikawei Museum, where reposes the type of the species, a comparatively young specimen, the skull exceeds that of adult specimens of *U. cinereus*, which in turn is larger than any of the other forms.

While in Manchuria I secured specimens of an adult female and a young male in the forest area north of I-mien-p'o, North Kirin, and I also saw skins of much larger specimens. The local hunters told me that full grown males sometimes weigh as much as 100 lbs. Allowing for exaggeration this is a far heavier weight than the 50 lbs. or 60 lbs. attained by any of the Chinese species.

In colour *U. raddeanus* is much greyer than any of the Chinese forms. It has light cream-coloured legs, the light patch on the throat being indistinct, and the tail long and of a white or cream colour, instead of black as in the other forms. There is a well defined and dark median dorsal line, which continues along the back of the neck and down the face, fading away on the muzzle.

Schrenck, who came across this goral in the Amur region, took it to be the Japanese animal, called by Temminck *Antilope crispa*. The latter animal, however, is smaller, more the size of the Chinese species, though I believe it is greyer in its coat. Of such a fact

as the comparative greyness of an animal's pelage, it is almost impossible to judge without actual specimens for comparison. I was able to compare Manchurian with North China goral skins but not with any from Japan.

It was with a considerable degree of surprise that I learned of the existence of gorals in the Manchurian forest area, for I had never associated the animals with forest surroundings, believing them to be inhabitants of high, rocky, mountainous and more or less barren districts. All those that I had hunted in North China occurred in such places. But here in the heavily forested area north of I-mien-p'o, there were a series of isolated ridges and peaks of granite towering hundreds, in cases as much as a thousand, of feet above the sea of pine, oak, walnut and other deciduous trees; and it was upon these peaks and ridges that the gorals lived. The chief peak, or set of peaks, rose abruptly on one side for nearly a thousand feet, on the others the slopes were so sharp as to make climbing a hazardous undertaking. Right on the top of this, undisturbed by any hunter, so the natives and Russians told me, till I climbed up at the imminent risk of my neck, the gorals had rested day by day, who can say for how long? The thick piles of their excreta showed that it had been a favourite resting place for many generations; and it was on this very peak that I finally secured my two specimens.

Spending the day in the safety and seclusion of these high peaks, the gorals, at dusk, leave their eerie fastnesses, and descend to the grass-grown slopes, just above the tree line to feed, or right down into the forested valley to drink, finally returning at break of day to the high peaks and ridges. As I noticed in Shansi, so in Manchuria, these animals love to sit on some commanding spur of rock, and scan for hours the country below them. When doing this they sometimes sit upon their haunches, dog fashion, at other times they lie out upon a sunny rock, and resemble nothing so much as some large feline. Indeed, their movements, as they jump or dodge from rock to rock, are cat-like in the extreme.

That the gorals frequently wandered in the forest in the vicinity of the peaks and ridges they haunted, was evidenced by the numerous tracks that we noticed, as well as their excreta. In various directions from the main outcrop of rock, other rugged ridges and scarps ran, and between them the gorals had beaten regular paths through the woods, which paths the natives, in winter, beset with

snares to capture these animals, whose lovely soft pelts are very valuable. In order to prevent the victims from circumventing the snares, fences are built on either side, so that the goral must pass through the fatal gap. As far as I could ascertain this is the only method employed in taking the goral. It has the advantage of being just as effective should, as not infrequently happens, a musk-deer pass the same way, for the latter animal, too, loves the rocky ridges that run through the forest.

Thus it will be seen that the Manchurian goral is a forest, as well as a cliff-inhabiting species. Subsequently I discovered in the forested areas of the Tung Ling (N. E. of Peking in Chihli) gorals living under conditions almost identical with those just described, the only difference being that the cliffs were much higher, the country being a truly mountainous one. The gorals, which I secured in this latter area belonged to Milne-Edwards' species *U. caudatus*, that occurs throughout North Shansi and Chihli.

The distribution of the Manchurian goral appears to be fairly extensive. Schrenck records it from the Amur; Radde does the same; and Heude from the Ussuri basin; while, as already stated, I secured specimens in the North Kirin forest. Though I did not come across it, nor even hear it mentioned by the natives in the upper basin of the Sungari, or along the Yalu, it does not follow that the animal does not occur in these localities, for so elusive a creature might long escape discovery in heavily forested areas.

Gorals are sporting animals of the first order, for they are as difficult to bring down, and when secured afford as pretty trophies, with their fine coats and shiny black, shapely, though not very large, horns, as any of the smaller denizens of the wilderness that come in the category of big game.

The young are born early in the year, and attain their full growth in about two years, though, of course, not their full horn development. The horns are larger and longer than those of the Chinese gorals, being thicker at the base, and very prettily annulated. I do not know if any records of the Manchurian goral occur, for it is doubtful if any Europeans but Russian hunters of the peasant class have shot these animals.

The Chinese name is *Ch'ing Yang*, or grey goat; while the Russians called them *Barran*.

73. Wild Sheep.

Ovis nivicola, Eschscholtz.

Ovis nivicola Eschscholtz, Zool. Atlas, I. pl. 1.

Coming within the scope of the Manchurian Region, we have at least two forms of wild sheep. One occupying the coastal regions of the Amur, is referrable to Eschscholtz's *Ovis nivicola*, described from Kamschatka, the other, which appears to be as yet undescribed, occuring in the extreme west of our region.

Schrenck records a wild sheep under the name *O.* (*Aegoceros*) *montana* Desm. from the Amur region, which is doubtless *O. nivicola*. While in Harbin I saw a specimen of a wild sheep that did not belong to any species known to me. It was said to have come from the province of Heilungkiang, to the north-west of Harbin. My friend Schroder, while visiting this region (Hai-lar), heard of the existence of wild sheep, which seems to clinch the matter.

Head of a Wild Sheep in the Grand Hotel, Harbin, Manchuria: said to have come from the Hai-lar district.

The little hunter that I employed in the Yu-shu-ch'a district in the West Kirin forest told me that wild sheep occurred a long way to the east of that locality, where he had seen them himself. His description was very realistic, and I could not help feeling that he had indeed seen a true wild sheep.

The sheep I saw in Harbin, the skin and mounted head being nailed up on the wall in the Grand Hotel, could not be referred to *O. nivicola*. Its chief distinguishing feature was its thick, and curly forelock, which commencing at the base of the horns ended in a point between and below the eyes.

Unfortunately I could not form an opinion of the horns, as the cores alone remained, but I wrote down the following description of the animal:

Colour resembling *O. jubata*, Peters* of North China, but much lighter throughout. No white croup-disk, but a small light fawn patch. Tail, light fawn at its base, dark at tip. Hair hollow as in the *Cervidæ*. Heavy, curly forelock of brown: no mane. About the size of a full grown ewe of *O. jubata*.

I also made the accompanying sketch of the head, which does not agree with the figure of *O. nivicala* in "The Royal Natural History," Lydekker.

The sheep had the appearance of being an intermediate form between the true *O. ammon* group and that to which *O. nivicola* belong.

To what species the sheep seen by the little hunter of Yu-shu-ch'a belongs it is, of course, impossible to say, nor is it possible to be certain of the exact area; but it may be that it was in the mountains of the Primorsk.

O. nivicola is one of the smaller forms of these kinds of wild sheep, being more closely allied to the North American wild sheep than to the giants of Central Asia.

The specimen I saw in Harbin cannot represent Severtzov's *O. argali dauricus*, since the figure he gives does not show the very pronounced frontal fringe of the former, yet the region it was said to have come from is identical with that assigned to Severtzov's

* The name *jubata* having been found to be preoccupied, this species has recently been renamed by N. Hollister *O. comosa*. Proc. Biol. Sos. Wash., Vol. 32, p. 46. Apr. 11, 1919.

form, namely *Dauria*, which occupies the upper basin of the Nonni River. Here is a matter for further investigation, and it may turn out that Severtzov's name is valid (though no mention is made of the frontal fringe) and applies to the wild sheep occupying the south-western area of Heilungkiang in Manchuria, and neighbouring Eastern Mongolia.

74. Mongolian Gazelle.

Gazella gutturosa, Pallas.

Gazella gutturosa, Pallas, Spicil. Zool., 1767, XII, p. 46, fig. 2.

This graceful animal occurs only in the western part of the Manchurian Region, where the arid steppes of Eastern Mongolia encroach upon the more fertile terrain of South-western Heilungkiang and North-western Kirin.

It is a large animal, as gazelles go, with a mere stub of a tail, about half the size of a man's little finger. It ranges through Central Asia, parts of Siberia, Mongolia, being abundant in Inner, or Southern Mongolia, where it extends into Chinese territory in Northern Shansi and Chihli. In Eastern Mongolia it extends as far as Tsi-tsi-har, and at one time not so many years ago, almost reached Harbin.

It is of a light chestnut buff colour with light under parts in summer, its coat becoming long, thick and of a light grey-buff colour in winter. In Southern Mongolia I have seen this animal in herds of several hundreds, as well as in much smaller ones. Usually animals of both sexes occur together, though often in summer the adult males separate from the others and go about in small herds of from three to six individuals.

The young, generally two in number, are born early in the spring, the mother retiring for this purpose to adjacent low hills where such occur. The little animals can run soon after they are born and in a few weeks can easily out-distance the swiftest horse.

The Mongols hunt the gazelle in various ways, always with the use of rifle or match-lock gun. Driving is the favourite method, a number of horsemen going out on to the plains, and rounding up as many gazelles as they can, herding them towards some point where men with guns lie hidden in pits. By digging two converging rows of pits or shallow trenches, and driving the gazelles into the wide end, the frightened creatures can be forced right up to the guns, as they will not jump over, or pass between the pits. In this way a large number may be killed in a single drive.

For true sport, however, the European may go out upon his pony, and, accompanied by an attendant, also well mounted, may have a splendid time pursuing and shooting his quarry.

Further west in Mongolia another related gazelle occurs, namely *Gazella subgutturosa*, Guldenst.*

75. Przewalski's Gazelle.

Gazella przewalskii, Büchner.

Gazella przewalskii, Büchner, Mél. Biol. Acad. St. Pétersb., Vol. XIII, p. 161, 1890.

Przewalski's gazelle, which also occurs in the extreme western parts of the Manchurian Region, may be distinguished from the foregoing by its small size, and comparatively long, bushy tail. It ranges throughout Mongolia. I saw it in the Ordos Desert and on the borders of Northern Shensi. It apparently prefers the more purely desert areas, for I did not come across it in the grasslands of Southern Mongolia, though it is plentiful as soon as the sandy wastes of the Gobi are reached a little further north. A few years ago, while travelling on the Chinese Eastern Railway from Harbin on my way to Europe, I saw several herds of these gazelles from the train window. One herd of eight actually tried to race the train, and, wonderful to relate, kept abreast of my window for some time. Incidentally, I may mention that a Mongol horseman tried to do the same thing a few minutes later, and made a very creditable performance, though not so good as that of the gazelles.

Mr. Wishniakowski had a specimen head of what I took to be this animal at I-mien-p'o, which he said was secured by Nicholai a little way the other side of Harbin some years before.

The horns of this species are very graceful, being proportionately longer than in *G. gutturosa*, and more sharply hooked and curved.

*Act. Ac. Petrop. 1778, I, p. 251, pl. 9-12.

CHAPTER XI.

The Wild Boar.

God gave the horse for man to ride,
And steel wherewith to fight,
And wine to swell his soul with pride,
And women for delight:
But a better gift than these all four
Was when He made the fighting boar.

* * *

Drink then to women and to wine,
Though heart and head they steal—
But here's to steed and spear and swine
A brimming glass, no heel,
And humble thanks to God who saw
His way to make the fighting boar.

Julian Grenfell.

CHAPTER XI.

The Wild Boar.

Family Suidæ.

Who of all the goodly company of big game hunters does not feel a certain quickening of the pulse at the mention of that most sporting of the denizens of the wilderness, the wild boar?

To those who have hunted him, whether with spear and pony on the plains of India, with torch and beaters in the dank jungles of the tropic islands, or afoot with rifle in the hills of the Yang-tzu Valley or the mountains of North China, or yet again with dogs in the Manchurian forest, what visions of the chase does his name not conjure up!

Whenever I take up my pen to write upon the subject of the wild boar, I find thoughts and impressions come so thick and fast, memories so numerous, that I experience considerable difficulty in setting them down in anything like order. The chase of the wild pig is associated in my mind with all my happiest, and most enjoyable experiences of the wilderness. Camp-fire scenes rise up before me; the smell of pine-wood burning; the blaze in the darkness, reflected upon the rugged features of my companions, as the day's adventures are gone over again and again. Then come the sights and smells of the mountain side as one follows again the intricate trail, now plain upon some bare, brown stretch of crumbling shale, now hardly descernable in the yellow grass, or withered leaves of the scrub-oak. The quarry glimpsed; the moment's breathless pause as the rifle sights come on; the slow press of the finger upon the trigger; the kick and report of the gun; the dull thud or spirt of dust, as the bullet finds or misses its mark; the fleeing quarry, and the wild scramble to the next ridge-top; the boar breaking cover once more, and the final shot—all pass before the mind's eye, only to be blotted out by that final truimphal scene when the quarry, it may be a mighty tusker, lies dead, a trophy of trophies, at one's feet.

But this chapter cannot be devoted to such scenes of the chase, for its object is to place before the reader an account of such of the East-Asiatic wild swine as come under our notice in dealing with the fauna of the Manchurian Region, wherein dwells the largest and finest of all the many variations of *Sus scrofa*, the true wild boar.

It is impossible to deal adequately with the Manchurian wild boar, without referring to other related species in North China, Corea and Japan, and the reader will pardon me if I go rapidly over the whole subject of the status of these species, which, like those of the sikas, and gorals, was reduced to chaos through Heude's multiplication of names.

It would be a waste of space to give all these names, as I dealt very thoroughly with the subject in my paper, already mentioned, in the *Proceedings of the Zoological Society of London* (*April, 1917, pp. 7-26*). Suffice it to say that of the pigs inhabiting the Yang-tzu Valley he distinguished some eleven or twelve species, all the specimens upon which he based his descriptions having come from an area within a radius of less than two hundred miles of Nanking, while of those from various parts of Manchuria he made out five distinct species. Besides these he named three species from South Shensi, one from Corea, and one from Japan in addition to the already well known species *Sus leucomystax*.

However, amongst all these names, it appears that there are some genuinely valid ones. I went over Heude's material in the Sikawei Museum, and after carefully arranging the skulls from various districts, and comparing them with one another, I do not hesitate to say that there are at least four, possibly five, distinct mainland forms and one from Japan, making six in all. These are:

1. *Sus paludosus*, Heude. Yang-tzu Valley. Type from Chin-kiang, Kiangsu.
2. *Sus moupinensis*, M.-Edw. The Upper Han Valley, Shan-si, Shensi, Kansu, Ssu-chuan and E. Thibet.
3. *Sus gigas*, Heude. Forests of Manchuria, Amur, and Primorskaya. Type from Vladivostok.
4. *Sus coreanus*, Heude. Corea. Type from Fusan.
5. *Sus meles*, Heude. South China. Type from Kuangsi province.
6. *Sus leucomystax* T. et S. Central Japan.

The Yang-tzu pig (*S. palludosus*) is a large species with a long skull, much longer than in *S. leucomystax*, with which Swinhoe, confused it, small tusks, and a tendency to a high forehead with a deeply concave cranial outline.

The Moupin pig (*S. moupinensis*) is characterized by a shorter and broader skull than in *S. palludosus*, and differs from *S. leucomystax* in being larger. It is darker than the Yang-tzu form, with less conspicuous white markings on the cheeks, though these are present and quite distinct. It also has longer and heavier tusks.

The Corean species, *S. coreanus**, is smaller than either *S. palludosus* or *S. moupinensis*, while *S. meles* from South China is a little known form, and in any case does not concern us here.

76. Manchurian Wild Pig.

Sus gigas, Heude.

Sus gigas, Heude. Mém. Conc. l'Hist. Nat. de l'Emp. Chin. Vol. II, pt. 2, p. 87, pl. XXA, fig. 1, 1892, and Vol. III. pt. 4., p. 189, 1897.

Of the five names given by Heude to the wild pigs of Manchuria only one can be considered valid, and as the first name accompanied with a description takes presidence over the others there is no choice but *Sus gigas*. This name was based upon two fine complete skulls from Vladivostok. The enormous size of these at once distinguish the species from anything in China, another very noticeable feature being their extreme narrowness. Of the skulls on which the other species were based I could discover only two in Heude's collection, one being a portion of a skull from the Ussuri region, representing *Sus ussuricus*, the other being that of an immature specimen from the Sungari Valley representing Heude's *Sus songaricus*. Of these, what remained of the Ussuri skull agreed with those from Vladivostok, though it was of a younger animal; while the young female skull from the Sungari, when compared with a female skull of about the same age from the Yang-tzu, showed a comparative narrowness. Of Heude's other specimens, representing his names *S. mandchuricus*, and *S.*

* I have recently received information regarding the dimensions of the pigs from Corea, and from this it would seem that they are fully as large as those from Manchuria. A boar shot near Gensan weighed 450 lbs., and stood 38 inches at the shoulder. It had 5½ inches of tusk exposed, while, judging from a photograph of the animal, its pelt was very dark. This strongly suggests that the Corean and Manchurian pigs belong to the same species.

canescens, I could find no trace in the Museum. However, since with the others there has proved to be so little to warrant the distinguishing of more than one species, it seems improbable that the specimens from Mukden should represent distinct form, especially as it is highly improbable that they came from anywhere but the Sungari basin, or the Kirin forest, to the east of Mukden.

As already indicated *S. gigas* is at once distinguishable from the Chinese forms by its enormous size, and the great length and proportionate narrowness of its skull. This fine pig carries truly magnificent tusks. Those of the skulls from Vladivostok were the finest I have ever seen. The tusks of the smaller of the two measured 10 inches in length in spite of a fractured point, while those of the larger could not be extracted from the jaw. They measured an inch and five eighths in diameter, and, judging from appearances, must have measured at least 12 inches.

An old Chinese priest near I-mien-p'o gave me a pair of tusks that measure 10 inches in length, and $1\frac{1}{4}$ inches in thickness, while Nicholai and Mr. Wischniakowski had several pairs that ran over 9 inches. Of the series of a dozen or more skulls in the Sikawei Museum from the Yang-tzu not one had tusks measuring over 8 inches in length, or an inch in thickness. The longest tusk from Shansi I have measured was 10 inches in length by $1\frac{1}{4}$ inches in thickness.

In colouring the Manchurian pigs are distinctly darker than those from the Yang-tzu and other parts of China. The Yang-tzu pig, by the way, is a very light form, the lightness being due to the pelage being washed with white or light grey. In the new coat of adults, and in the coats of immature specimens, there is a distinct reddish-brown tinge, not noticeable in any of the other species mentioned, but very marked in pigs from further south.

The Shansi pigs are intermediate in colour between the Manchurian and Yang-tzu forms.

In Manchuria the wild pigs haunt either the oak-covered slopes, or the pine forests; for it is upon one or other of these trees that they largely depend for their sustenance, and strangely enough there never fails a good crop of nuts from one or the other of them. In seasons when the acorns fail, the pine nuts are plentiful, and *vice versa*.

Very old boars lead a solitary life, for the most part seeking the society of the herd or sounder only when amorously inclined. There seems to be no very definite mating season, as there is with most other ungulates. I have come across an old boar in attendance upon a sow in May, and at the same time saw other sows with their broods of little striped porkers, about two months old. This was in Shansi. A small sow killed in January in the same province contained six foetal young, well developed. I have also seen the tracks of very young pigs, not more than a few weeks old in September. Allowing sixteen weeks for the period of gestation, this means that mating must have taken place in about November and May, respectively.

Very old boars, or females with families, keep to themselves, but all other pigs of both sexes and all ages herd together in sounders of from three to fifteen individuals. Very often the surviving members of a litter will keep together forming a sounder long after the mother has gone into seclusion preparatory to having her next brood. An old boar, followed by a young one or two will join in, and so a mixed sounder is formed.

Pigs, as is well known, grow very rapidly, and, owing to the size of the litters, and the fact that each has at least two families a year, multiply very rapidly. Indeed they would absolutely overrun the forest were it not for the devastating diseases to which they are subject. Epidemics occur periodically and sweep away hundreds of these animals. Even so, a district depleted of its pigs one year will be over-run again in three or four years. I have seen this happen three times in Shansi in the last fourteen years.

The same thing happens in Manchuria, to judge from all accounts. Nicholai told me that the wild swine in the North Kiriu forest sometimes collect into enormous herds numbering from forty to a hundred individuals.

While exploring the forests round I-mien-p'o I came across several wild pigs' nests, which consist of hollows scooped in the ground, covered with a dome of hazel stems and branches, and lined with soft grass. They are generally placed on some low ridge. Here the young are born and spend the first fortnight of their existence.

Pigs usually have a rubbing tree, on which they scratch themselves, and which the boars scour with their tusks. For this purpose a stout young pine is usually chosen.

CHAPTER XII.

Steller's Sea-Cow.

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Steller's Sea-Cow.

Order SIRENIA.

We now have to consider a single member of an extremely interesting, though comparatively small, group of mammals, which, though possessing many external characteristics in common with the whales and their relaives, yet cannot be classed with the latter. I refer to the members of the *Sirenia*, which comprises the sea-cows, halicores or dugongs, and manatees.

There are a number of living species, all of which are tropical or sub-tropical in their habitats; but at one time, not so very distant, as time goes in the matter of the evolution and extinction of animal forms, there lived in certain parts of the North Pacific a gigantic species of sea-cow, known to scientists as *Rhytina gigas* or *Hydrodamalis stelleri*, which became extinct in the year 1768.

To this animal is usually given the popular name of Steller's sea-cow, after Steller, who was one of the earliest explorers in these seas, discovering the sea-cow in 1741. It represents an extreme type in the evolution of the group, in that it was characterized by the complete absence of teeth, mastication being assisted by horny plates in the mouth.

Of the various members of the *Sirenia* the manatees (*Manatus americanus* and *M. senegalensis*) are characterized by the possession of a comparatively large number of teeth, namely, eight molars in the upper and seven in the lower jaw. The bones of the muzzle also are straighter than in the other forms, and there are no signs of any incisor teeth. The tail has what may be described as a rounded or spatular form. In the dugongs (*Halicore dugong* and *H. australis*) the molars are reduced to two in each jaw; while in *H. australis* there are two tusk-like teeth in the extremity of the upper jaw, which is very sharply bent downward. The tails in the dugong have flukes very much as in the whales.

In Steller's sea-cow, as already stated, the teeth are entirely absent, the muzzle is bent downwards, the tail is fluked; while the animal attained enormous proportions.

The food of these creatures consists of sea-weed, and their lips are adapted in a wonderful way to the seizing and passing into the mouth of this form of food. The fore-limbs have become flipper-like, though they are capable of greater manipulation than in the whales; the hind limbs in all living species have become entirely suppressed.

Fossil forms have been discovered, however, which show rudimentary hind limbs; and from the nature of the skeletal structure of these, palæontologists believe these animals to have been descended through an ungulate ancestor, which fact at once precludes them from being classed with the whales.

77. Steller's Sea-cow.

Rhytina gigas, (Zimmermann).

Manati gigas, Zimmermann, Geogr. Gesch. II, p. 426, 1780.

Hydrodamalis stelleri, Retzius, Vetensk. Acad. Nya Handl. Stockh., XX, p. 202, 1794.

In his book, "Travels of a Naturalist in Manchuria and Japan," Adams states that he picked up a dugong's or halicore's skull on the shore of Aniwa Bay, Saghalin Island. As the true dugongs are tropical in their distribution, it seems unlikely that Adams was correct in his diagnosis of the species to which his skull belonged, especially as the waters in these northerly regions are rendered cold by a cold current setting in a southerly direction along the north-eastern shores of Asia from the Arctic, which would preclude the possibility of any inhabitant of the warm tropical waters straggling thus far. It is much more reasonable to presume that the skull in question was that of a Steller's sea-cow, which by some means had straggled south from the true habitat of this species, and had died, at some more or less remote date, in the area in which it (the skull) was found.

Our species was known only to inhabit the seas in the Bering region, where it occurred at one time in immense numbers along the shores of Commander Islands. It is supposed to have become extinct as long ago as 1768. Having regard to the set of the cur-

rent, it is conceivable that the sea-cow occurred, in winter at least, along the Kuril Islands and even as far south as Saghalin Island; while the discovery of the skull by Adams some time just previous to 1870, the year in which he published his book, might almost suggest that the animal survived, though certainly it must have been in greatly reduced numbers, till a much later date than 1768.

When first discovered this animal occurred along the shores of the Commander Island in great herds, feeding upon the 'kelp,' which abounds in these regions. They were, apparently, very stupid and slow, and so fell an easy prey to whalers, by whom they were ruthlessly butchered for food, and so exterminated.

Resembling the dugong in shape, the northern sea-cow may be distinguished by its enormously greater size, and, as already stated, the absence of any teeth, its colour being black, and body hairless.

The early explorer and observer, Steller, while making an enforced sojourn on Commander Island through being shipwrecked there, spent much of his time studying the anatomy and habits of these extraordinary animals, and he has left an excellent account of his observations. Since his time others have written upon the species, so that it has quite an extensive literature of its own. (See bibliography).

The question of the survival of the sea-cow till a much later date than 1768 has formed the subject of considerable discussion. the idea being strongly combated by Stejneger, Prof. A. E. Nordenskjöld being its chief supporter.

CHAPTER XIII.

The Rodents and Lagomorphs of the Manchurian Region.

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The Rodents and Lagomorphs of the Manchurian Region.

Order RODENTIA.

Where two types of animals occupy the same locality, unless they become in some way mutually beneficial to each other, the tendency is for competition or warfare, not necessarily belligerent, though such may actually occur, but economic—if such a term can be applied to non-reasoning organisms—to take place between them.

One of the best examples of this is the competitive warfare that has been, and is still, going on between the antelopes and the deer. Formerly antelopes were prevalent all over Europe, to judge from fossil remains: to-day their place is held by cervine forms. Wherever condtions are suited to the existence of deer there we find them, but seldom associated with antelopes or gazelles, except, perhaps on the border-line between the deer-inhabited country and desert, or semi-desert country, where deer cannot survive, and therefore antelopes still hold sway. It has been said that it is only the existence of the great Sahara Desert stretching across North Africa that has prevented the invasion by the deer family of the more fertile parts of Middle and Southern Africa, which in consequence have become the last great stronghold of the antelopes.

Similar keen struggles take place in the faunas of all parts of the world though they may not be so apparent. In studying such groups as the rodents we are often confronted with evidences of this economic warfare, for these animals are what may be called a successful type, and by reason of the rapidity of their increase continually threaten with inundation other types of mammals.

It will be remembered that when dealing with the *Insectivora* of the Manchurian Region we noticed a surprizing paucity of these animals as compared with the neighbouring islands of Japan and Saghalin, and Central and West China, in spite of the fact that Manchuria presents conditions, climatic and otherwise, eminently favourable to these forms of mammals.

After due consideration one is led to the conclusion that this scarcity of insectivores in general, and shrews in particular, is due to an extraordinary abundance of murine rodents on the mainland, most of whom are omnivorous in their habits.

It is not suggested that there are a great many different species of rats, mice, hamsters, and voles, for this is far from being the case, but that there is an abundance of individuals, and that it is the universal prevalence of these that has more or less ousted the shrews, and to a lesser extent the hedgehogs, and moles, from what otherwise would be their rightful habitat.

It may be argued that since shrews are insectivorous, and rodents, by the very nature of their teeth, herbivorous, fructivorous, and graminivorous, there need be no competition between the two groups. Leaving out, for the moment, any other consideration, it may be shown that both murine rodents and shrews are to a considerable extent omnivorous. Judging alone from baits used in traps, this fact is evident. My own experience is that shrews will take a fruit or grain bait as readily as one of flesh, and the same applies to rodents. Anderson, whose great success as a collector in Japan and China was due to his ability as a trapper, and with whom I worked and associated in North China, also found this to be the case. He told me that in Japan he caught as many shrews and moles with traps baited with oatmeal paste and dried fruit as he did rodents, and it was our joint experience that nearly all the North China rodents could be caught with traps baited with flesh. Again, I have found all kinds of rodents eat with avidity insects of various kinds offered to them.

Besides the question of the struggle for the food that the country offers, there is that of housing. With an abundance in the country of small murine rodents, which, nevertheless, are larger and more powerful than the shrews, the latter must often find themselves ousted from their dwelling places.

Thus on two very important scores the insectivores find themselves in competition with the rodents, and apparently have gone under in the struggle.

The reason why rodents should be so plentiful as to threaten the very existence of the insectivores in Manchuria, and not in Japan or Central and West China, is not so clear. Ordinarily one would not have expected to find rodents so numerous in the Man-

churian Region because of its dampness, for rodents undoubtedly thrive best in a moderately dry country. North China and Southern Mongolia afford an instance of this with their seventy-six (76) distinct species and subspecies of rodents, which in many areas are characterized by an enormous number of individuals, and which include many genera not represented in neighbouring areas at all; nor can Japan, Corea, Manchuria, Central and West China show such a list. Whatever the reason the fact remains that members of a certain limited number of species of rodents are extraordinarily abundant in the Manchurian Region, and with that we must leave the question, and give our attention to the various forms themselves.

I secured specimens of but fourteen different species and subspecies of rodents in the various districts I visited, of which only one turned out to be an entirely new species. This was *Apodemus praetor*, Miller, the large wood-mouse. Thomas has recorded eight forms from Saghalin, where Anderson collected, and seven from the mainland, naming some twelve new species, which do not include *Craseomys regulus*, a vole, and *Cricetulus nestor*, a hamster rat, both originally described by him from Corea, and both prevalent throughout Manchuria. Schrenck recorded some seventeen species of rodents from the Amur and Saghalin, some of which were new to science, but for many of which he used the wrong names.

From all these sources it is possible to compile a list of thirty-five species and subspecies from the Manchurian Region, of which twenty-seven are purely mainland forms, five are peculiar to Saghalin Island, and three occur both on the mainland and on that island.

In this order, as with most of the others, the species differ from their congeners of neighbouring North China in being darker or richer in colouring, and generally of a large size.

Family Sciuridæ.

The first family we have to consider is the *Sciuridæ*, or squirrel family, in which there are six distinct genera occurring in the Manchurian Region. These are *Sciuropterus*, *Sciurus*, *Sciurotamias*, *Eutamias*, *Citellus*, and *Arctomys*, or the flying squirrels, true squirrels, David's squirrel, chipmunks, ground squirrels, or susliks, and marmots.

78. Flying Squirrel.

Sciuropterus russicus, (Tiedemann).

Pteromys russicus, Tiedemann, Zool. I. 1808, p. 451.

This member of the interesting genus of flying squirrels known as *Sciuropterus* was described and named by Tiedemann as long ago as 1808. It ranges from Siberia into Manchuria. The genus is represented in Eastern Asia by a number of forms, about some of which very little is known. They range from the Thibetan border in West China to the Japanese Islands. The Kansu form is known as *S. buchneri*, and was described by Satunin in 1902.*

A number of specimens of flying squirrels collected by me in West Shansi were at first thought to represent a distinct species, but subsequently were referred to *S. buchneri*, owing to the lack of material from Kansu for comparison. A member of the genus occurs in the mountains of South Shensi, where I saw a living specimen, but was unable to secure any for my collection. The squirrel I saw was a true *Sciuropterus* and not a specimen of the much larger *Trogopterus xanthipes* M.-Edw. which also occurs there and in Chihli. I have also seen living specimens and dried skins of a *Sciuropterus* from the Tung Ling in Chihli, about a hundred miles to the North-east of Peking. Next comes our present species, *S. russicus*, occupying the Manchurian forested areas and the Amur, with *S. aluco*, Thos. to the south occupying Corea, *S. russicus athene* Thos. in Saghalin Island, and *S. momonga* and *S. m. amygdali* Thos. in the Japanese Islands. Judging from the wide gaps of unforested areas that occur between the habitats of the Shansi, South Shensi, and Chihli flying squirrels of this genus, and those of *S. buchneri* on the one hand, and *S. russicus* on the other, as well as between each other, it is probable that these squirrels will ultimately be found to represent three distinct species, or at least subspecies.

S. russicus is of a dark grey above, light underneath, with a certain amount of buff in the tail. The winter pelage is thick and long, and of a lighter colour. *S. aluco* is a pale buffy-drab, not of such a clear grey as in *russicus*. Its tail is also more buffy. *S. momonga* is still more inclined to drab.

*Ann. Mus. St. Petersb. VII, 1902, p. 3.

Schrenck records it as *Pteromys volans*, L. from the Amur region, while Allen records it from East Siberia (*Bull. Ann. Mus. Nat. His. XIX, 1903*).

79. Saghalin Flying Squirrel.

Sciuropterus russicus athene, Thomas.

Sciuropterus russicus athene, Thomas, Proc. Zool. Soc. Lond. 1907. pp. 409 and 410.

This subspecies, as Mr. Thomas remarks, is a local race of the Russian and Siberian *S. russicus*. He describes it thus: "General colour above drab-grey, the tips of the hairs clay-colour; under surface dull whitish, the sides slightly washed with reddish brown. . . . Skull with the long palatal foramina and large bullæ of *S. russicus*, each of these parts being markedly smaller in *S. momonga*."

The members of this genus are amongst the most beautiful of the whole rodent order. They want to be seen and handled in a living state to be appreciated. Their fur is long, thick and wonderfully soft, while their huge, black eyes, and gracefully curved, flat but bushy tails, give them a beauty all their own. They make charming pets, readily becoming tame when in captivity. They are dainty feeders, living, in the wild state, upon nuts, the buds and bark of certain trees, and berries.

They live in holes in trees, or build themselves nests of moss and lichens, which are placed at the junction of a small branch or branches with the upright trunk of a pine or spruce. They are exceedingly quick in their movements. Supported by a long bone from the wrist, a broad web of skin covered with fur stretches from the fore paw to the hind. The flatness of the tail helps the little animal to steer when indulging in one of its so-called flights. This consists of a leap into space, and then a long *vol-plane* to a neighbouring tree. It commences with a long, gentle, downward sweep, but turns up rather sharply at the end. When one of these squirrels alights on a tree trunk its protective colouring is such that it becomes invisible at once. It can lie so flat as to look like nothing more than a slight lump in the bark of the tree.

The Chinese name is *Fei Shu*, meaning 'flying rat.'

80. Manchurian Fur Squirrel.

Sciurus vulgaris mantchuricus, Thomas.

Sciurus vutgaris mantchuricus, Thomas, Anm. and Mag. Nat. Hist. ser. 8 vol. 4. p. 501, Dec. 1909.

Of the four or five different races of the common fur squirrel, *Sciurus vulgaris*, found in these parts the Manchurian form, to which Thomas has given the above name, is the most valuable as a fur producer. It is dark grey above, with a reddish wash in summer, which disappears completely in winter; the underparts are a pure white. The tail is large and bushy. The squirrel itself is a large form, larger than the European species.

It differs from our next form, another subspecies of the common European squirrel, in having a greyer winter pelage, and a less red summer coat. It is also larger.

While in the I-mien-p'o district of North Kirin I was afforded plently of opportunity of observing these lively and graceful dwellers in the forest. The speed with which they will mount to the topmost branches of the oaks and walnuts, their wonderful balancing feats upon thin, slender branches, and their daring leaps into space, as they almost fly from tree to tree, are a revelation to any one who has not seen them in their native haunts. One can easily see how the flying squirrels acquired their powers of volplaning.

The food of this squirrel consists mainly of nuts. In a wild state they partake but sparingly of berries or other juicy fruits. They make large stores of acorns, hazel nuts and walnuts, hiding them under rocks, or windfalls, or in hollow trees. The strange thing is that they never seem to remember where they made their store, or if they do, do not make use of them, for one often finds their stores late in spring, having remainsed untouched throughout the winter. It would seem as though this storing habit were a relic of some ancestral form, that found it necessary during hibernation, as with the chipmunks.

The Chinese name is *Hui Kou-tzu*, meaning 'grey dog.'

81. Saghalin Fur Squirrel.

Sciurus vulgaris rupestris, Thomas.

Scuirus vulgaris rupestris, Thomas, Proc. Zool. Soc. Lond. 1907 Apr. 23 (pub. Aug. 1, 1907) pp. 410 and 411.

The Saghalin representative of the fur squirrels was described by Mr. Thomas from specimens collected by Anderson in 1906. Its claim to distinction lies in its being smaller than neighbouring species.

Its colour in summer is reddish, more so than in the Manchurian species, though it is distinctly darker than in *Sciurus vulgaris orientis*, the Japanese subspecies. Mr. Thomas had no winter specimens for examination, but I do not doubt that in winter the reddish colour disappears.

Recently while going over some of the material I collected in neighbouring North China and comparing it with material in the Natural History Museum at South Kensington, I found that the fur squirrel inhabiting Corea was distinguishable from those of neighbouring countries including Manchuria. I therefore described it a distinct form (*Ann. & Mag. Nat. Hist.* Ser. 9, Vol. VII, pp. 252-3, 1921) under the name *Sciurus vulgaris coreæ*. Its distinguishing features are its browner coat (which shows no rufous colouring even in summer) than other forms and its shorter and wider skull. It ranges into South Manchuria and therefore by rights should be included in our list.

82. David's Squirrel.

Sciurotamias davidianus, M.-Edw.

Sciurus davidianus, M.-Edw., Revue et Magasin de Zoologie, 1867, p. 196, and Rech. sur les Mamm. Vol. 1. p. 160. 1868-74.

We now come to an animal, which, strictly speaking, belongs to the North China faunal sub-region, namely David's squirrel, a connecting link between the pouched chipmunks and the true squirrels. It occurs in the mountains and hills that extend into South-western Fengtien from Northern Chihli, and so can claim a place in our list of Manchurian Mammals.

This squirrel is less of a forest-inhabiting species than most of its family, occurring mainly in open and sparsely vegetated hills, though it also occurs in the forested and wooded mountainous areas of North China. It is essentially an animal of rocky cliffs, where it scrambles about with great agility.

In size this squirrel agrees with the Manchurian fur squirrel, but in other respects is a very different animal. It has no tufts on the ears, the hair of the body being more of a drab colour on the upper parts, creamy-buff on the under parts. It is provided with cheek pouches as in the chipmunk, but is not striped, nor does it hibernate.

Miller perceived these intermediate characteristics between the chipmunks and the true squirrels that distinguish this form and created the separate genus *Sciurotamias* for it.

83. Manchurian Chipmunk.

Eutamias asiaticus orientalis, (Bonhote)

Tamias orientalis, Bonhote, Ann. and Mag. Nat. Hist. (7) IV. Nov. 1899, p. 385.

The chipmunks of Eastern Asia have been divided into a number of subspecies of Gmelin's *Tamias asiaticus*, now known as *Eutamias asiaticus*. This splitting up of species has been based on large series of good specimens from all parts, so that they can be accepted without demur. Commencing in Kansu in the west of North China, and working eastward we have first *Eutamias asiaticus ordinalis*, Thos. a pale, sandy desert form that occupies Northern Kansu, the Chinese borders of the Ordos Desert and neighbouring North Shensi. Southern Kansu, Shensi and Shansi are occupied by a *E. a. intercessor* Thos., which is darker and greyer and less ochraceous than *ordinalis*, yet has more buffy coloured sides than the Chihli subspecies *E. a senescens*, Miller. This latter was described from the mountains near Peking. Next comes *E. a. orientalis*, Bonhote, occupying Manchuria, Corea, the Amur and, probably, the Primorsk. This is a very richly or intensely coloured form. Finally we have *E. a. lineatus*, Siebald, from Japan.

The Manchurian form I found common everywhere from the Yalu River to the province of Heilungkiang, and in none of the series I collected could any features distinguishing them from one

The Manchurian Chipmunk, (*Eutamias asiaticus orientalis*).

Photo by The Manchurian Plague Prevention Service.

A Mongolian Marmot, taken at Hai-lar in Heilungkiang by the members of the Plague Prevention Service.

another be detected. Schrenck gives two forms as occurring in the Amur region, namely *Tamias striatus*, L. and *T. uthensis*, Pallas, (Zoo. Rosso-Asiat. I. p. 189). He is certainly wrong in regard to *striatus*, which is not an Asiatic form, while *uthensis* is a Siberian form and probably does not occur in our region.

Described originally from the Amur region *E. a. orientalis* is characterized by the conspicuous reddish colour of the head and lower back, which characteristic is noticeable in the chipmunks from all over the Manchurian Region. Thomas recorded *E. asiaticus* from the Kinghan Mountains.

This handsomely marked and richly coloured species, like its congeners from other parts, inhabits both the forest areas and the barer hills, though in the latter case it always likes a certain amount of vegetation. It lives in burrows, which it excavates itself, and where, in large chambers, it stores quantities of nuts and seeds for use during the winter. It goes into hibernation as soon as the frosts set in, and does not reappear till spring. Though usually called a ground squirrel the chip munk is an expert climber, and spends a great deal of its time in trees. Its food consists of nuts and seeds, though it is very fond of the wild apricot. In some places the chipmunks become a positive pest to the farmers, robbing their millet and corn not only in the field, but even in the store-houses, and barns, where they seem thoroughly capable of holding their own against the ubiquitous rat.

84. Manchurian Suslik.

Citellus mongolicus ramosus, Thomas.

Citellus mongolicus ramosus, Thomas, Ann. and Mag. Nat. Hist. ser. 8, Vol. IV, pp. 501-502. Dec. 1909.

The only place where I personally encountered susliks in Manchuria was in the Liao-tung Peninsula near Port Arthur. Here I saw a number from the train window as I was travelling to and from that port. Nevertheless they occur throughout the plains of the west, and Thomas has described a distinct subspecies of *Citellus mongolicus* from the vicinity of Ch'ang Ch'ün in North-eastern Kirin. This is *C. m. ramosus* which he describes thus: "Colour as in *C. m. umbratus*, or even slightly darker; less distinctly speckled. Tail as bushy as in true *mongolicus*, that of *umbratus* far less so."

Allen describes two other forms, namely, *C. buxtoni* from East Siberia, and *C. stejnegeri* from Kamchatka. It is possible that the latter inhabits the coastal regions of the Amur, and Primorskaya. *C. m. umbratus* was described by Thomas from Inner Mongolia as being darker than true *mongolicus*, which, strangely enough, occurs in Chihli, Shansi, Shensi and the Ordos.

The susliks as a group are purely terrestrial in their habits, and may be said to occupy a place intermediate between the chipmunks and the marmots, though they are more closely related to the latter. They are more truly ground squirrels than the chipmunks can be said to be.

Creatures of the steppes and deserts, as well as of the grassy plains in more fertile areas, the susliks are well adapted to their surroundings. They are short of hair and tail and ears, so that they are not hampered in their extensive digging operations. Their forelimbs are strong, the paws being armed with powerful claws. Their eyes are set high up in the head, which enables them to scan the plains for terrestrial enemies, or by a slight tilt of the head to scan the skies for aerial foes. Their colour, a sort of sandy yellow, usually matches their surroundings. They excavate deep burrows with large store-chambers, and, like the chipmunks, store away food for the winter, though in their case it consists of dried grass and herbs.

The suslik never seems to travel far from its burrow, and when alarmed immediately makes for it, diving down and hiding till the danger is over. From the mouth of its burrow it often sends forth a piercing high-pitched scream when danger threatens.

85. Siberian Marmot.

Arctomys sibiricus, Radde.

Arctomys bobac, var. *sibiricus*, Radde, Reisen in Süd. von Ost. Sib. p. 159, 1862.

Specimens of marmot which came from Western Manchuria were referred by Dr. Thomas to Radde's *Arctomys sibiricus*, though Schrenck recorded this animal under the name *A. bobac*, Schreb. A steppe-inhabiting animal, this marmot occurs in the south-western part of the Amur, Western Heilungkiang, and North-western Kirin. It is popularly known in the East as the *Tarabagan*, the Mongol name, and is important in the fur trade. Enormous

numbers of skins are exported annually. It was believed at the time of the great pneumonic plague that swept these regions in the winter of 1910-11, that the *tarabagan*, played the part of the common rat in the bubonic plague of more tropical climes. This was investigated by the Plague Commission, and it was found that these marmots undoubtedly suffered from plague, but that there was no evidence to show that it was transferred from them to human beings by fleas, though it was believed that the Chinese hunters, who, unlike the Mongols, did not know the evil effects of taking infected animals, did not hesitate to pick up and skin marmots that had died of the plague, with the result that many of them caught the terrible disease and died. It was the Chinese, who, terror stricken at the outbreak of the plague, which is endemic in these regions, fled back to Manchuria, and thence into North China to their homes, carrying the infection with them. But the marmot got the blame, nevertheless, and there was said to be a great slump in the export of the skins.

These marmots live in small colonies on the steppes, excavating deep burrows. In appearance they somewhat resemble the suslik, but are much larger, and more heavily built; darker in colour and with a good, soft pelage. The tail is short and bushy, the external ear very small, the eyes large and prominent, but neither as large in proportion nor as prominent as in the suslik. The size is about that of the badger.

The Chinese name is *Ta La* or *Han Ta*, meaning 'land-otter.'

Milne-Edwards described an allied form, *Marmota robusta*, from North-western China.

Family Dipodidæ.

This family is represented in the fauna of the Manchurian region by but two genera and three species, namely *Allactaga mongolica* (Pallas) from the part bordering East Mongolia, *Sicista concolor*, Buchner, from the forests of the mainland and *Sicista caudata*, Thomas, from the Island of Saghalin. The members of the two genera *Allactaga* and *Sicista* are widely different in appearance and habits. The former is a desert or steppe animal closely related to the jerboas, but larger, and having five toes. It has very long hind legs and a long tail with a fine brush at the tip; also long ears almost like those of the hair. *Sicista* is a

small mouse-like rodent, with comparatively short hind legs and ears, and a long tail with no brush at the tip. It is a wood-inhabiting form.

It is within the realms of possibility that some form of jerboa (*Dipus*) may be found in South-western and Western Fengtien, as this animal has recently been found on the Sino-Mongolian border not far from its junction with the Manchurian frontier, but so far no actual records have been made.

86. Mongolian Allactaga.

Allactaga mongolica (Radde).

Dipus jaculus var. *mongolica*, Radde, Mél. Biol. Acad. Sc. St. Pétersb., III, p. 680, 1861.

The allactaga, or five-toed jerboa, occurs all over Mongolia, a closely related subspecies, *Allactaga mongolica longior*, Miller, extending into North China in North Shansi and Kansu. Eastward its range extends across the Mongolo-Manchurian frontier into South-western Heilungkiang and probably also into North-western Kirin, possibly even into Western Fengtien.

Rather a large rodent, the allactaga is characterized by its long ears, which it can fold back; its short fore legs, which nevertheless are armed with long, sharp claws, enabling the animal to burrow with ease; its long hind legs, with five toes, three touching the ground, and two about half way up the tarsals towards the heel; and its long tail, with a fine black and white brush at the end. The colour is a sort of buff-drab or buff-grey above, white beneath, with a broad white band across the rump.

The animal proceeds by means of a series of long jumps, from two to six feet in length. It lives in burrows which it excavates itself.

The Mongols call it *Allactahai* or *Allactagai*, the Chinese name is *T'iao T'u-tzu*, or 'jumping hare.'

87. Buchner's Sicista.

Sicista concolor, (Büchner).

Sminthus concolor, Büchner, Mélanges Biol. Bull. Acad. Imp. Sci. St. Pétersbourg, Vol. 13, p. 267, 1892.

Büchner gives the type locality of this species as Gui-dui-scha, north foothills of the Alps of Ssinin (Si-ning), Gansu (Kansu). While in the forest at Samafalo, near I-mien-p'o (North Kirin),

I secured a single specimen of a small long-tailed mouse, which I took to be *Sicista*, and which Mr. Miller subsequently identified with the above species. In a letter to me he says; "Büchner's specimen was in alcohol so that it is possible yours may eventually prove to be distinct. So far as the original description goes there is absolutely no difference between the two specimens either in color or size. Your record makes a considerable extension of range for *concolor*; but Thomas has described a related form from the island of Sakalin so that the occurrence of *Sicista* in Manchuria is not unexpected."

From this it does not seem altogether certain that the Manchurian *Sicista* is really to be placed in Büchner's species; and it is probable that were more specimens from both areas available some specific differences would be found between them. Between the forests of Kirin and those of South-western Kansu there is a gap of about fifteen hundred miles, in which no specimens of *Sicista* have been taken, and it seems incredible that so rare a form of mouse should be identical in such widely separated areas.

The rarity of this type of mouse may be judged from the facts that Büchner secured but one specimen, Dr. J. A. C. Smith but one in South-western Kansu, the late Mr. M. P. Anderson one in Saghalin, and myself also but one in the Manchurian Region; nor, I can vouch for it, was it for the want of trying that Dr. Smith. Anderson or myself failed to secure more. My specimen was caught by Nicholai, my Russian hunter and guide, while we were chopping open a hollow tree-trunk in search of flying squirrels. Having thus discovered a specimen of this rare species I investigated every hollow or rotten tree we came across, chopping them down or splitting them open; but without any result. I also set traps baited with all sorts of things; again without any success.

The colour of my specimen, which Mr. Miller says agrees with that of *S. concolor*, is mouse-brown above, very much as in the common house-mouse, and a light cream on the under surface, lighter on the lips and chin. The tail, which is nearly double the length of the head and body, is uniform in colour, and covered with short hairs. A comparison of this description with that of our next species *S. caudata*, Thomas, from Saghalin, shows that the mainland form differs from the island species; nor can it be confounded with the other known species of *subtilis*, *leathemi* and *tianshanica*.

88. Saghalin Sicista.

Sicista caudata, Thomas.

Sicista caudata, Thomas, Proc. Zoo. Soc. Lond., April 23rd, 1907, p. 413.

This member of a very rare genus was discovered by Anderson in Saghalin Island, and described as new by Mr. Oldfield Thomas as resembling Büchner's *S. concolor* from Kansu in size and colouring, and in the lack of the dorsal stripe occurring in *S. subtilis*. It differs from *S. leathemi* Thos. and *S. tianshanica* Salensky in having its tail of one colour, and not bi-coloured as in these two species. It may be distinguished from *S. concolor* in its longer tail and shorter tooth series.

In colour it is a pale brown on the back, slightly lighter on the sides, and greyish underneath. The chief feature of this little mouse is its very long tail.

Family Muridæ.

The murine rodents of the Manchurian Region constitute a well represented group, and form by far the greater part of the rodents of the region. They comprise the true rats and mice, *Epimys*, *Mus*, and *Apodemus*, the hamsters, *Cricetulus*, the voles, *Microtus*, *Craseomys*, *Evotomys*, and *Arvicola*, and the mole-rat, *Myospalax*, altogether nine genera represented by nineteen species, possibly more.

As a group these rodents are closely related to those of North China, though, as already stated, the species usually differ from their congeners of that country in being larger and darker or more intense in colouring.

89. Siberian Brown Rat.

Epimys norvegicus caraco (Pallas).

Mus caraco, Pallas, Nov. Sp. Glir., 1778, p. 91, 335, pl. XXIII.

From time to time, and in various places, I secured specimens of the common, or brown, rat in Manchuria, all of which have been referred to Pallas' *caraco*, a subspecies of the true brown, or Norwegian, rat of Europe.

Mr. Thomas, writing of specimens from Chu Chia Tai, near Ch'ang Chün, North Kirin, says: "This would appear to be the short-footed Eastern representative of *M. norvegicus*, but the only adult specimen has lost its skull, so that I am unable to give any definite opinion."

Mr. Miller in reference to specimens collected by me says: "The exact agreement of some of the not fully adult Kirin specimens with Pallas's account convinces me that the Manchurian and East Siberian representative of *Epimys norvegicus* is the original "*Mus caraco*" as suggested by Thomas in 1909. Karshtschenks has, however, recorded his opinion to the contrary and has proposed the new subspecific name *primarius* for the eastern form. Both *caraco* and *socer* are distinguishable from true *norvegicus* by less harsh fur, more hairy tail (the annulations mostly concealed, and the colour of dorsal surface of tail noticeably darker than that of body), shorter hind foot, and by the smaller skull with more abruptly constricted interorbital region, and more nearly parallel ridges at interparietals tending to be equal to or less than that between post-orbital angles, while in true *norvegicus* it is usually (though not invariably) greater."

Schrenck records it as *Mus decumanus*, L., though Radde uses the name *caraco* for the rat that occurs in Transbaikalia and eastward.

My specimens collected on the Sungari River in Kirin province enabled Mr. Miller to identify and describe a new subspecies from North China,* specimens of which had first been sent by Mr. W. W. Simpson from Tao-chou in Kansu in 1905, others being secured by me in 1908-09 in Yu-lin Fu, and near Yen-an Fu in North Shensi. This subspecies was named *Mus norvegicus socer*, and is distinguishable by its considerably paler colouring. The type of this new subspecies measuring 200 mm. is larger than even my largest specimen from Kirin; but a specimen which I collected near Fu-chin Hsien on the Heilungkiang bank of the Sungari River measured 213 mm., and I think it probable that on the whole the Manchurian rats are larger than those from North China.

The habits of this species differ in no way from those of rats the world over, and so there is no need to say anything here. Suffice it to say that in Manchuria, as elsewhere, these rats are a formidable pest to the human inhabitants.

*Proc. Biol. Soc. Wash. Vol. XXVII, pp. 91 to 92, May 11th, 1914.

90. Sulphur-Bellied Rat.

Epimys confucianus, M.-Edw.

Mus confucianus, Milne-Edwards, Arch. Mus. 1871, VI, Bull., p. 93., and Rech. Mamm., 1874. p. 286, pl. XLI, fig. 2.

The sulphur-bellied rat is smaller, more delicately built than the brown rat, with proportionately larger ears and longer tail. In colour it is a light brown above with white underparts, washed with a pale sulphur yellow. The posterior portion of the tail is white, as also is the whole of the under surface. The coat is often interspersed with stiff spine-like hairs.

It is an inhabitant of rocky, mountainous, or hilly ravines, where it lives in the deep cracks and crannies.

It is distributed over the hilly areas of Chihli and Shantung, closely related subspecies occurring in neighbouring regions.

The present species ranges into Manchuria in the South-west of Fengtien, though it must be considered as belonging to the North China faunal sub-region.

91. Manchurian House-Mouse.

Mus wagneri manchu, Thomas.

Mus wagneri manchu, Thomas, Ann. and Mag. Nat. Hist. ser. 8. Vol. 4, No. 62, pp. 502 and 503, Dec. 1909.

In Manchuria the common house-mouse is represented by a dark form to which Mr. Thomas gave the name of *Mus wagneri manchu*. In size it agrees with the North China forms *Mus wagneri*, Eversmann, and *M. w. mongolium*, Thos. The latter was described from Inner Mongolia; but it occurs also in North Shansi, North Shensi, and the Ordos, while the former, the Central Asian form ranges into Kansu, and as far south as Southern Shensi.

The Manchurian form differs from these in being very much darker in colour.

Specimens I secured on the Upper Sungari were a dark drab-grey above, slightly lighter on the underparts. They were trapped on the river's bank near a farmstead.

92. Ussurian Harvest-Mouse.

Mus minutus ussuricus, Barrett-Hamilton,

Mus minutus ussuricus, Barrett-Hamilton, Note on the harvest-mice of the Palæarctic region. *Ann. and Mag. Nat. Hist.*, ser. 7, vol. 3, pp. 341-345, April, 1889.

This little mouse was described as being "far darker on the upper surface than *Mus minutus*, and the red colour on the rump far duller; as in *minutus*, the dark colour of the upper surface becomes lighter on the flanks, but, unlike *minutus*, there is no distinct line of demarcation, and the white colour of the underside, instead of being pure, is washed with a dirty yellow."

It is rather a large form, about equal in size to the European house-mouse (*Mus musculus*), and presumably occupies Manchuria as well as the Ussuri region. It is interesting to note here again a darkening of colour and an increase in size over neighbouring species from China. Milne-Edwards described *M. m. pygmæus** from Ssu-chuan on the Thibetan border. Specimens have been recorded from Kua-tun in Fukien (S. E. China). I secured a specimen on the Yangtzu near Nanking. It measured 57 mm. in the length of its head and body, as compared with 78 mm. in the Ussurian form.

93. Great Wood-Mouse.

Mus sylvaticus major, Radde.

Mus sylvaticus, var. *major*, Radde, Reis. im. Süd. v. Ost-Sib. Vol. I, p. 180, 1862.

Radde described a large form of what he took to be a member of the *Mus sylvaticus* group from the Bureija Mountains, and so I give it here, though it is possible that his specimens represent our next species.

94. Manchurian Wood-Mouse.

Apodemus praetor, Miller.

Apodemus praetor, Miller, Proc. Biol. Soc. Wash., Vol. XXVII, pp. 89-90, May 11th, 1914.

Mr. Miller in describing this handsome mouse from specimens which I collected in the Upper Sungari basin, says of it: "Like *Apodemus peninsulæ* Thomas, but size greater, ear longer, and skull more robust; ground color of upper parts slightly darker and less yellowish than in *A. peninsulæ* in corresponding coat."

* Rech. Mamm. p. 291, pl. XLIII, 1874.

The measurements of the type and an adult female are: head and body, 115 mm. and 110 mm.; tail, 119 mm. and 112 mm., as compared with those of the largest specimens of *A. peninsulæ* given by Thomas: head and body, 100 mm. and 101 mm.; tail, 102 mm. and 93 mm. It should be stated that *peninsulæ* is the Corean form.

The summer coat of our species is of a rich brown, inclined to chestnut, above, greyish white below. In winter the chestnut tinge is less in evidence. The ears are rather large, the tail long.

Our form is like *A. nigritalus*, Hollister from the Altai Mountains, but has a longer ear and a less convex dorsal profile of the skull.

The type locality of *A. praetor* is: Sungari River, 60 miles South West of Kirin, Kirin Province, Manchuria. It should have been given as south, south-east of Kirin, the original label being wrongly marked.

Radde records *Mus sylvaticus, var. major* from the Bureja Mts. and it is possible that he was referring to specimens of this mouse; but there is no way of proving this as it is also possible that some form of *M. sylvaticus* does occur in these regions.

The members of this new species (i.e. *A. praetor*), like their relations from Corea and North China, are purely wood, or forest-inhabiting, for which reason I have always called them wood-mice. In some places they occur where woods no longer exist, but their presence in a district is a sure indication that that district was wooded at no very distant date. The same applies to the North China and Corean forms.

These mice have a wide range, extending all over North China. It would almost seems as though there were a number of subspecies, as a glance at the following measurements of specimens from different districts will show:

Manchuria.	Head & Body.	Tail.	Hind foot.	Ear.
Apodemus praetor,	115 mm.	119 mm.	26 mm.	16.5 mm.
Corea.				
Apodemus peninsulæ,	107 mm.	111 mm.	23.5 mm.	15 mm.
Shansi.				
Apodemus sp.,	89 mm.	80 mm.	23 mm.	16 mm.
South Shensi.				
Apodemus sp.,	86 mm.	100 mm.	22.5 mm.	16 mm.

Photo by W. A. Mace.

Specimens of small mammals collected by the author in Manchuria. Left to right, top row: *Sciurus vulgaris mantchuricus*, Thos., *Eutamias asiaticus orientalis* (Bon.), *Epimys norvegicus caraco* (Pall.), *Apodemus agrarius mantchuricus* (Thos.), *Mus wagneri manchu*, Thos., *Apodemus prator*, Mill., *Meles amurensis*, Schrenck, *Sorex annexus*, Thos., *Crocidura lasiura*, Dobs., *Mogera robusta*, Nehr.; lower row: *Microtus pelliceus*, Thos., *Cricetulus fumigatus*, Thos., *Cricetulus nestor*, Thos., *Mustela nivalis pygmæus*, Allen, *Erinaceus amurensis*, Schrenck.

It will be seen that the Shansi form has the proportionately shortest tail, while the South Shensi form has the longest. So far these two forms have been referred to *A. peninsulæ*, in spite of the fact that they are markedly smaller, almost 20 mm. shorter in the one case, and over 20 mm. shorter in the other.

The habits of these mice are very much those of other mice. They live in burrows, coming out to feed at night. They do not hibernate. Their food seems to consist of nuts, seeds, and any kind of animal matter they find in the woods. They fight a good deal amongst themselves, and maimed specimens are very commonly trapped. They will take any form of bait, and are easily trapped.

95. Saghalin Wood-Mouse.

Apodemus speciosus giliacus (Thomas).

Micromys speciosus giliacus. Thomas, Proc. Zoo. Soc. Lond. 1907, Apr. 23 [pub. Aug. 1, 1907] pp. 411 and 412.

In Saghalin Island the wood-mouse is represented by the subspecies *Apodemus speciosus giliacus*, which Mr. Thomas described as most closely resembling the Corean form. The ear, however, is noticeably shorter than in that form, and even more so than in *A. praetor*, the Manchurian form. The colour was said to be slightly darker than in *peninsulæ* and so may be about as in *praetor*.

Following are measurements of two specimens: head and body, 104 mm. and 103 mm.; tail 110 mm. and 113 mm.; hind foot, 24 mm. and 23.5 mm.; ear, 14.5 mm. and 14 mm.

96. Manchurian Field-Mouse.

Apodemus agrarius mantchuricus (Thomas)

Mus agrarius mantchuricus, Thomas, Proc. Zoo. Soc. Lond., Nov. 15, 1898, footnote p. 774.

A mouse that is also found in the forests of Manchuria, as well as in the open country and on the plains is the field-mouse, *Apodemus agrarius mantchuricus*, Thos., which, like the wood-mouse, is represented by a number of subspecies in neighbouring countries.

It was described as differing from other known forms in being of a brighter, richer colour, with the black stripe down the back broad and well defined. "Similar to *M. a. typicus* in all essential respects, but slightly larger, and of a much lighter, richer, and more uniform rufous above and on the sides, the grey tone present in *typicus* being quite lost in the rich rufous of the Eastern form." Measurements in the flesh are given as follows: head and body (probably stretched), 116 mm; tail, 78 mm.; hind foot, 19 mm.; ear, 14 mm.

There are four mainland subspecies of *A. agrarius* distinguishable, namely *A. a. coreæ*, *A. a. mantchuricus*, *A. a. ningpoensis*, and *A. a. pallidior*, from Corea, Manchuria, East Central China and Shansi and Shensi respectively. A related form *A. fergussoni* from West China is without the stripe; while *A. a. pallidior*, as the name suggests, is a pale form.

These field-mice resemble the wood-mice in size and colour, but differ in having smaller ears and hind feet, and shorter tails, and also in the presence of the black dorsal stripe.

I call them field-mice because they occur as much in the open as in forests and woods, even where there is no indication that forests ever occurred.

A. a. mantchuricus is universally distributed throughout Manchuria, and probably occurs in the Amur and Primorskaya.

97. Corean Giant Hamster.

Cricetulus nestor, Thomas.

Cricetulus nestor, Thos. Proc. Zoo. Soc. Sond., May 7, 1907 [Pub. Oct. 8, 1907] p. 466.

Originally described from Kim-hoa, 65 miles north-east of Seoul, Corea, this large hamster rat, which is akin to the North China *Cricetulus triton*, de Wint., occurs throughout Manchuria. I took specimens on the Yalu, the Upper Sungari, and in the I-mien-p'o district of North Kirin.

It was described as: "Allied to, but even larger than, *C. triton* de Wint. Size largest of the genus, the type with longer foot and longer toothrow than *C. triton*, hithertoo by far the largest known species."

Since the above description was published an equally large, if not larger form has been described from Shansi under the name of *C. triton incanus* by Mr. Thomas from specimens collected by Anderson and myself, where the smaller *C. triton* also occurs. Indeed it is probable that the latter species extends from Chihli into South-eastern Manchuria.

Equal in size to the brown rat this hamster has smaller feet, shorter tail, and shorter ears. It is of a fine grey colour, very little lighter on the underparts than above. Owing to the fact that its enormous cheek pouches, which are characteristic of the hamsters, are usually more or less filled with food, which it gathers while foraging about preparatory to storing away, the hamster usually has a peculiar wide flat appearance about the head and fore quarters.

Though occurring in the forest these rats seem to be most plentiful where there are cultivated fields, round the edges of which one may always find their burrows. The latter consist of round vertical shafts, which take a diagonal direction after a depth of over a foot is reached, and then lead into a living chamber, off which is usually one or more large store chambers. These are filled with grain, beans, nuts, anything edible that the rats find. Their mania for storing leads these animals to accumulate far larger quantities than they require even during the severest winter. This is in cultivated areas where gleaning is good. Probably in the forest they are unable to store up more than they require.

These large hamsters are very fierce and savage. They indulge in frequent fights amongst themselves, and except when mating live in solitude. They are difficult to tame, and bite savagely when handled.

The Chinese name is *Ts'ang* or *Ts'ang Lao-shu*, meaning a storer, or store-rat.

This hamster appears to be the same as Ognev's *Tscherskia albipes*, from the Usuri, but there seems to be no good reason why a new genus should be created for it, nor as far as can be made out is there any valid reason for separating the Ussurian form.

98. Manchurian Striped Hamster.

Cricetulus fumatus, Thomas.

Cricetulus griseus fumatus Thomas. Ann. and Mag. Nat. Hist. ser. 8. vol. 4, pp. 500-505, Dec. 1909.

This small hamster, which so far has only been recorded as occurring on the open plains and wide river valleys of Manchuria, belongs to the *Cricetulus griseus* group. This comprises a number of species and subspecies, scattered throughout North China and Inner Mongolia. They are a good deal smaller than the giant hamsters of the *C. triton* group, their size about equalling that of the field and wood-mice (*Apodemus*). They have soft grey fur, lighter underneath, varying in tone or shade in the different species. There are four of these forms, three species and one subspecies. They are: *C. andersoni*, Thos. a rather dark grey form without any median dorsal line, which occurs in the mountainous and hilly areas of Shansi, Shensi and Kansu; *C. griseus* M.-Edw. a lighter form with a clear black stripe that occurs on the Chihli plain; *C. griseus obscurus* M.-Edw. a paler form of true *griseus*, in which the stripe is not so definite, and which occurs in North Chihli, North Shansi and Inner Mongolia; and finally our present species *C. fumatus*, Thos., which is darker and distinctly brown, instead of grey, though the black median dorsal line is distinct, and which as already indicated occurs on the plains, and in the wide valleys of the large rivers of Manchuria.

Mr. Thomas in describing this subspecies says: "Essential characters as in *C. griseus*, but the colour darkened throughout. General colour above between brocoli-brown and hair-brown of Ridgeway. Black dorsal line heavier, more distinct and carried forward more definitely on to the crown of head. Under surface grey No. 8, the tips of the hairs grey No. 10. Skull as in *griseus*."

Mr. Miller in writing to me about specimens which I sent to him, suggests that as they are so different from true *griseus* they might be treated as a full species and not only a subspecies of that form, which suggestion I have adopted here.

I found this species fairly common on the river bank at Oakwood Farm, near Fu-chin Hsien on the Heilungkiang bank of the Lower Sungari River. The species was originally described from Chu-chia-tai, near Ch'ang Ch'ün, in North Kirin. As far as my experience goes it does not occur in the forested areas.

My specimens were all taken along recently constructed mud dykes, or on some heaps of dried flax-stalks, but owing to the ravages of nocturnal insects, and possibly other rodents, I did not get a single perfect specimen.

99. Manchurian Reed-Vole.

Microtus pelliceus, Thomas.

Microtus pelliceus, Thomas, Ann. and Mag. Nat. Hist., ser. 8, vol. 7, pp. 383 and 384, April, 1911.

We now come to a very distinct group of murine rodents, the voles, of which a number of genera and species occur in the Manchurian Region.

First of these is the handsome reed-vole, which Mr. Thomas described in 1911 under the name *Microtus pelliceus* thus: "A large vole allied to *M. calamorum*, Thos.

"Size large as compared with ordinary voles, about as in *M. calamorum*. Fur long, soft, very sleek and fine; hairs of black about 15 mm. in length, the long bristle-hairs attaining 20 mm. or more. General colour above sepia-brown, formed of mixed black and dull buffy, the resulting mixture very heavily and coarsely lined. Under surface soiled greyish white, the bases of the hairs slaty, the ends dull whitish. Ears rather short, dull greyish brown. Hands and feet brown on metapodials, whitish on digits; soles with only 5 pads. Tail long, well-haired, the hairs quite hiding the scales; sharply bicolor, deep brown above, white below.

"Skull of the same high and rather narrow shape as in *M. calamorum*; upper outline rather less bowed.

"This fine vole is distinguished from *M. calamorum* by its larger size and longer fur. No other described species seems to be nearly related to it."

The measurements given are: head and body, 150 mm.; tail, 70 mm.; hind foot, (S. U.) 23 mm., (C. U.) 25.5 mm. This is slightly larger than any of the specimens I secured.

I first came across this vole in the Yen-t'ung La-tzu district on the Upper Sungari, indeed this was the only place where I secured specimen. It was very plentiful here, occurring along certain parts of the river bank and up a side stream, keeping always to low lying more or less swampy ground close to the water's edge.

Feeding upon the leaves of a tall weed that grew in these parts, its whereabouts could always be detected by little heaps of the lanceolate leaves, carefully laid together, the leaves lying side by side. The basal part of each had been eaten. These heaps were usually placed at the base of the plant from which the leaves had been cut.

These voles are diurnal in their habits, and by proceeding quietly I often saw them playing about either on the water's edge or even out in the open away from the shelter of the taller herbage. I never once saw one take to the water itself, and conclude that though fond of damp places they are not aquatic like the water voles.

It is interesting to find this vole, whose nearest relative is the Yang-tzu reed vole, (*C. calamorum*), in this region. Apparently the two species agree closely in their habits.

Ognev created a new genus *Alexandromys* for this vole, but there does not appear to be sufficient reason for this.

100. Corean Red-back Vole.

Craseomys regulus, Thomas.

Craseomys regulus, Thomas, Proc. Zool. Soc. Lond. 1906 [Pub. Apr. 11, 1907] pp. 863-865.

The only other species of vole, besides *Microtus pelliceus*, of which I secured specimens, was a handsome red-back vole. I found it prevalent all over the wooded and forested areas, and even in the open valley of the Lower Sungari. Specimens taken on the Corean bank of the Yalu, in the Kirin forest, and on the Lower Sungari, have all been referred to Thomas's Corean species *Craseomys regulus*, which has also been recorded from Chihli, Anderson having collected specimens at the Ming Tombs, near Peking.

In describing this species Mr. Thomas gives the size as scarcely less than in the Japanese forms, *C. bedfordiæ*, and *C. andersoni*. He says: "General colour above coarsely-lined cinnamon-brown in most specimens, but darkening in old individuals to a rich and beautiful cinnamon-rufous or hazel of unusual intensity. Sides paler; without marked line of demarcation from either back or belly; under surface broadly washed with pinkish buff, the bases of the hairs slaty as usual." It differs from *Evotomys amurensis* in having a shorter tail and an altogether bigger and heavier skull.

The size of my largest specimen may be judged from the following measurements: head and body, 110 mm.; tail, 47 mm.; hind foot, 19 mm.; ear, 13 mm.

This vole is a forest-inhabiting species, though, as already indicated, it occurs in more open areas. It is very common, in some places even more common than the wood-mice and field-mice. It lives in hollows under decaying windfalls, or in hollow trees; as well as in burrows ramifying just under the surface of the ground, frequently coming above ground and taking the form of run-ways through the thick tangle of grass-stems or moss.

Members of these species appear to be fond of climbing on to dead tree stumps, and I could always be sure of a catch by setting a trap in such a position. They would take any form of bait. In their nests, which I sometimes found, were generally the shells of nuts and fruit-stones; but there is no doubt that these voles are largely herbivorous as an examination of their stomachs shows.

101. Yezo Red-back Vole.

Craseomys bedfordiæ, (Thomas).

Evotomys bedfordiæ, Thomas, Abstr. Proc. Zool. Soc., No. 23, p. 18 Dec. 5, 1905.

This fine vole from Yezo (Hokkaido), the northernmost of the Japanese Islands, has been recorded from Saghalin Island, where Anderson made a collection. It is closely related to the more southerly form, *Craseomys andersoni*, of Thomas, who described it as follows:—

"Size about as in the Scandinavian *E.* (*C.*) *rufocanus* Sund. Fur as in that species, long and loose; hairs of back about 10 mm. in length. General colour less contrasted red and grey than in *rufocanus*, the back darker chestnut, more *E. glareolus*-like, and the sides darker and less sharply contrasted grey. Under surface dull greyish washed with buffy. Cheeks like sides. Upper surface of hands and feet dull greyish, the fingers whiter. A prominent glandular patch present in male on each flank in front of the hip, rather further back than in *E. rufocanus*. Tail considerably longer than in *rufocanus*, less thickly haired, the rings of scales not hidden; brown above, dull white below.

"Skull apparently very much as in *E. rufocanus*. It may be noted that in not one of the specimens are the two bridges over the lateral grooves on the posterior palate complete, while they appear to be always complete in true *Evotomys*.

"Teeth broad and powerful, their pattern much as in *E. rufocanus;* last segment of m^3 simple, with scarcely any trace of a postero-internal re-entrant angle."

E. (*C.*) *latastei* Allen from Kamstchatka is a considerably smaller animal.

102. Amur Vole.

Evotomys amurensis, (Schrenck).

Arvicola (*Hypudaeus*) *amurensis*, Schrenck, Reis. und Forsch. in Amur-Lande, Vol. I, pp. 129-135. Taf. VI, fig. 1 and 2, 1885.

Mr. Thomas, who examined specimens of this vole from Saghalin collected by Anderson, found it to be a true *Evotomys* and not *Arvicola*, under which genus Schrenck described the species. Thomas says it is like *E. mikado* from Hokkaido, but differs in the reddish colour on the back being confined to a narrow band, the light colour of the sides coming much higher up on to the back. Its skull is shorter and proportionately broader. It appears to be a very common species, inhabiting the same places as *Craseomys bedfordiæ*.

As far as my investigations show it does not occur in Kirin or Fengtien, though it may be present in Heilungkiang.

103. Schrenck's Large-toothed Vole.

Evotomys maximowiczei, (Schrenck).

Arvicola maximowiczei, Schrenck, Reis imd Forsch. im Amur-Lande, vol. I, p. 140-144, 1885.

This vole differs from *amurensis* in being very much greyer, and in having larger and heavier teeth. It differs from Pallas' *A. saxatilis* in having slightly smaller teeth. Its tail also is shorter than in *amurensis*; while it differs from both *Craseomys regulus* and *Microtus pelliceus* in having white lips, chin and belly, and light feet.

104. Pallas' Large-toothed Vole.

Evotomys saxatilis (Pallas)

Arvicola saxatilis, Pallas, Nov. Spec. Quad. e. Glir. ord. p. 255 et sq. 1778.

On Schrenck's authority this vole is included in the fauna of the Amur, and therefore in that of the Manchurian Region. It does not appear to occur south of the Amur River, however. As already indicated it has larger teeth and a longer tail than Schrenck's *E. maximowiczei*.

105. Pallas' Red Vole.

Evotomys rutilus (Pallas).

Arvicola rutilus, Pallas, Nov. Spec. Quad. e. Glir. Ord. p. 246 et sq., 1778.

Schrenck records this vole from the Amur, and Oldfield Thomas gives it as occurring in the Kinghan Mountains. It differs from *Craseomys regulus*, Thos. in being less intensely coloured, and in having a shorter tooth row, which is 4.7 mm. as compared with 6.1 mm. in *regulus*. The skull also is smaller.

A comparison of specimens of *C. regulus* and *E. rutilus* shows that the under parts of the latter are whitish, while in the former they are greyish washed with a buff or ochraceous tint. Compared with specimens of *E. amurensis* it shows a lighter colouring and a shorter tail.

106. Water Vole.

Arvicola terrestris, L.

Arvicola terrestris, L. Syst. Nat., I, 1766, p. 82.

Schrenck records a water vole from the Amur Region under the name *Arvicola amphibius*, which, however, is wrong, since *amphibius* is the name for the British species, while *terrestris* is the one that should be used for the mainland form. Indeed, a specimen taken by Douglas Carruthers in Siberia at a point 100 miles west of Lake Baikal, and which now lies in the British Museum collection at South Kensington, agrees very closely with others from Norway. This specimen, whose locality comes nearer to our region than that of any other, and which I have had the opportunity of examining, is very dark, and at first sight bears a considerable superficial likeness to *Microtus pelliceus*,

Thos. which suggests that Schrenck might have mistaken the latter for a water vole, especially as none of the other species of vole described by him can possibly be referred to it; while it seems strange that the great explorer should have missed so conspicuous and characteristic a form. Be that as it may, the fact that *A. terrestris* is known to occur in East Siberia justifies us in including it in our list of Manchurian mammals, though in the course of my investigations I came across no evidence of its occurrence.

107. Manchurian Molerat.

Myospalax epsilanus, Thomas.

Myospalax epsilanus, Thomas, Ann. and Mag. Nat. Hist. Ser. 8, Vol. IX, pp. 94-95, 1912.

This new and interesting molerat, which was recorded by Schrenck under the name of *Siphneus aspalax*, Pall., was described by Mr. Oldfield Thomas in 1912 from specimens collected in the Khingan Mountains in South-western Heilungkiang; though he had first assigned it to Milne-Edwards' *Myospalax psilurus*.

He says: "This species is separable from *M. psilurus* by the different structure of the anteorbital region and parietal crests, these differences not coming out in comparison with the younger examples of Milne-Edwards's species, which alone I was able to examine in 1909." The habitat of *M. psilurus* is North-eastern China and neighbouring Mongolia, and, probably, Manchuria, distant as Mr. Thomas points out about 1200 kilometers from that of *M. epsilanus*.

Pallas's *M. aspalax* occurs in Siberia and Mongolia a considerable distance to the west of our region, and is at once distinguishable from *M. epsilanus* and *psilurus* by its coarser, harder hair.

As a class the molerats, of which there are a number of species and subspecies occurring in North China, Mongolia, and, apparently, Siberia, are related in some ways to the voles, though they are much larger, and have taken to a subterranean life. They are armed with long, thick claws on their fore-paws, which are large and strong, the forelegs and neck being particularly powerfully muscled. Their life is very much that of the mole, only their diet consists of roots and grain, instead of insect larvæ and worms. They tunnel through the ground at a great rate, often keeping near the surface, when the direction they take is indicated by broken up earth. I have seen voles of the genus *Microtus* do exactly the same thing, though not to the same extent.

The molerats are covered with soft fur, not unlike that of the moles; they have small eyes, no external ear, only a hole in the side of the head, broad, flat heads, blunt noses, powerful jaws and teeth, short, almost hairless tails, and pink, almost hairless feet. In colour they are grey, usually suffused with a brownish buff wash. In some forms, of which *M. epsilanus* is one, though not *M. psilurus*, there is a white diamond-shaped patch on the forehead.

In size they range from about that of a medium sized common rat to considerably larger than the largest specimens of that species. *M. epsilanus* appears to represent one of the larger forms.

The Chinese name for the molerat differs in different localities. In Shansi and westward it is known as *Ha-lao*, *Hsia-lao* or *Hsia-lao-hsu*, all meaning 'blind rat'; in Chihli I have only been able to get the name *Ti-p'ai*, which appears to be equally applicable to the mole, and means 'ground-digger.'

108. Chihli Molerat.

Myospalax psilurus, Milne-Edwards.

Myosphalx psilurus, Milne-Edwards, Rech. Mam. 1874, p. 127, pl. IX, A. et B.

Though as far as I know no specimens have actually been recorded from within the borders of Manchuria, it is certain that this molerat extends into south-western Fengtien, as do so many other North-eastern China species of mammal. It was one of the first species of its kind described from China, and belongs to the smaller of the two groups, of which *Myospalax fontanieri*, Milne-Edwards, may be considered as the type of the larger.

It is smaller than the foregoing species, has no white on the forehead, and is, if anything, slightly more buffy in its colouring. As indicated there are certain skull differences which further distinguish it. These differences are given by Mr. Thomas as follows:

"Anteorbital foramen (in *epsilanus*) with its outer wall not projected forwards above, or only very slightly in old age, the anterior profile-line from the shoulder of the Zygoma to the muzzle joining the latter practically without break, when viewed from above. In *psilurus* there is a strong projection forwards, as correctly shown in fig. 1,* this projection being less, though still evident, in the younger specimens. . . . Throughout the series this

*Rech. Mamm. pl. 9a.

difference is quite marked if specimens of corresponding age are compared, though the projection of old *epsilanus* is equal to that of young *psilurus*.

"Zygomata somewhat more widely spread. Interorbital region narrower, the crests approaching each other above much more closely anteriorly than on the parietals, these ridges being practically parallel in *psilurus*. Mesopterygoid fossa slightly broader."

An animal recorded by Schrenck, but which does not appear to belong to the Manchurian fauna, is the beaver (*Castor fiber*). It is true that skins of this animal have been secured from the natives in the Amur region, and that they find their way to the fur market in such places as Harbin and Mukden in Manchuria, but recent investigation tends to show that these skins have been brought from Alaska, having been bartered from one tribe of natives to another till they came into the hands of Russian or Chinese fur traders.

Before leaving the subject of the Manchurian rodents, it would be as well to make some mention of those peculiar murine forms, the lemmings. Though there appear to be no records of the occurrence of any form of lemming actually within the area defined for the purposes of this book as the Manchurian Region, yet it is possible that one or more species occur in the extreme north.

Middendorff records several forms from Siberia, some from the region of the South Okhotsk coast, but the names he used are doubtful.

Hinton has described a species, *Myopus saianicus*, from somewhere in the mountains on the north of the Amur basin, and this form may extend actually into our region, as also may Pallas' *Dicrostonyx torquatus*.

Order LAGOMORPHA.

Up till quite recently the members of the families *Leporidæ*, or hares and rabbits, and *Lagomyidæ*, or pikas, have been placed in the order *Rodentia*. That they do not belong to this order is evident from an examination of their structure, and today the similarity that exists between the Lagomorphs and the Rodents is considered to be due to what is known as parallel development.

Amongst other distinguishing features that exist between these two orders of mammals mention may be made of the occurrence in the *Lagomorpha* of two extra incisor teeth in the upper jaw, while their skulls have many bones that are incomplete.

Family Leporidæ.

The hares of the Manchurian Region have not been thoroughly worked out yet, that is to say, it is not definitely known how many species occur there, or what are the ranges of those that have already been identified in the country. From what is known of the hares of this area of Eastern Asia generally it is evident that a number of species occur within the political boundaries of the latter country.

To begin with, Schrenck recorded *Lepus variabilis*, Pallas, which is synonymous with *L. timidus*, L., as occurring in the Amur, while Radde described a new species, *L. mandshuricus*, from much the same region. Later, Mr. Thomas recorded *L. timidus*, L., as inhabiting Saghalin Island. Thus it is evident that *L. timidus* does actually occur in the Amur region; while specimens of hares collected by me in the North Kirin forest establish Radde's species as a perfectly good one.

In the west, where Manchuria borders on Mongolia, it is possible that Pallas' *L. tolai* occurs, though it is more likely that the hare from these regions as well as that from South and South-west Manchuria is the North-east China hare, *L. swinhoei*, Thos.; while *L. coreanus*, Thos., probably occurs in the Yalu Valley. More material from all parts is required before all this can be proved.

110. Manchurian Hare.

Lepus mandshuricus, Radde.

Lepus mandshuricus, Radde, Reisen in Süd. von Ost-Siberien, p. 215, pl. VIII, fig, 1, a-d, 1862.

I secured two specimens of hares in the I-mien-p'o forests, one of which was the usual buffy-brown colour, the other being of a pure black on the head and body, with white underparts, buff legs and inner ear-surface; throat, flanks, and rump sprinkled with white and buff hairs; and with a white diamond on the forehead.

Mr. Miller considers this specimen to be a sport, or at best a colour phase of the other. This may be so, but if it is it appears to be very common, for Nicholai and other hunters assured me that black hares were as common as brown.

Unfortunately I lost the skull of the brown hair, so that a comparison with that of the black specimen was impossible.

However, from an examination of the two specimens Mr. Miller was satisfied that they represented Radde's *L. mandshuricus*, which for a long time appears to have been a doubtful species, owing to no more material being secured.

Following is a description of the species, based on my specimens:—

General buff colour with extensive sprinkling of apparently black hairs, which, however, have the lower half white, the upper half black, with a buff band. This makes the back of the animal appear much darker than in *L. swinhoei*, in which the black on the hairs is very much less, and the buff correspondingly more. Fur generally much longer than in *swinhoei*. Underfur grey not buffy white as in *swinhoei*. Chin and under jaw light buff with sprinkling of black; belly and underparts white, washed with buff—pure white in *swinhoei*; under surface of tail grey; upper surface black. Hind feet very much larger and wider than in *swinhoei*, the buffy upper surfaces much darker. Altogether a more richly coloured animal. Skull much heavier and larger

Following are measurements of my two specimens.

Black form: head and body, 486 mm.; tail, 91 mm.; hind foot, 122 mm.; ear, 85 mm.

Buff form: head and body, 486 mm.; tail, 106 mm.; hind foot, 137 mm.; ear, 83 mm.

Corresponding measurements of a specimen of a Tientsin specimen of *L. swinhoei* are: head and body, 480 mm.; tail 85 mm.; hind foot, 110 mm.; ear, 83 mm.

L. mandshuricus appears to be a representative of a group of hares of the *L. europæus* type, which has not hitherto been recognized as extending into Eastern Asia.

I cannot say whether there is any seasonal change in this species, but doubt it. One of my specimens was secured after snow was on the ground, and it showed no sign of a change of pelt.

111. Varying Hare.

Lepus timidus, L.

Lepus timidus, L. Syst. Nat. 1766, I, p. 77.
L. variabilis, Pallas, Glir. 1778, I, p. 30.

This hare, which has a circumpolar distribution in the Old World, differs from the foregoing in both its summer and winter coat, for, whereas *L. mandshuricus* does not appear to change from brown to white at the approach of winter, *L. timidus* does. Moreover its colour in summer is considerably browner and less speckled than that of *L. mandshuricus*, which conforms more to that of *L. europœus*. In build it is lighter than either of the two latter.

As already stated Schrenck records it from the Amur under Pallas's synonym *L. variabilis*, while Thomas records it from Saghalin Island.

Family Lagomyidæ.

Our next and last family of mammals is that which includes those peculiar little animals, the pikas, known in America also as the coney or "Chief Little Hare."

The pikas are closely related to the hares and rabbits, but are all very much smaller, have wide rounded ears, and are almost tailless.

Where rocks occur pikas live in the hollows between and under them, but on the plains and in non-rocky hills, such as the *loess* hills of North China, they make deep and intricate excavations like rabbit warrens. They live upon grass, some species storing up heaps at the mouths of their burrows. They are not at all easy to trap.

Their range extends eastward to the western part of North America, westward to the Ural Mountains, and southward into the Himalayas.

In recent years a great many different species of pika have been discovered and described from North, North-central, and West China, and it has been found that they occur in every type of country from sandy plains and deserts to forested mountains, and bare hills, ranging in their vertical distribution from 1,500 ft. above sea level to at least 12,000 ft.

The exact range of the pikas in the Manchurian Region does not seem clear. One would expect to find them in all the mountainous areas at least, but so for they have only been recorded from the Khingan Mountain in Heilungkiang, and the Amur and Ussuri regions.

It is probable that on the western border the Mongolian form *Ochotona daurica*, Pallas,* which extends as far south as Inner Mongolia, occurs; but it has not been definitely recorded.

Two other forms have been described, namely *O. hyperborea cinereo-fusca*, Schrenck, and *O. h. mantchurica*, Thos., both subspecies of Pallas' *O. hyperborea* from Siberia.

112. Amur Pika.

Ochotona hyperborea cinereo-fusca (Schrenck).

Lagomys hyperborea cinereo-fusca, Schrenck, Reis und Forsch. in Amur-Laude. Vol. I, pp. 1859.

Schrenck described this subspecies of Pallas' *Lagomys hyperborea*, now *Ochotona hyperborea*,† from the Amur region. Thomas records it from the Ussuri, at the same time describing another subspecies from the Khingan Mountains. Pallas' species is a northern form, and probably occurs within our region to the extreme north.

Our present subspecies appears to be a rather small one, being characterized by its russet colour.

113. Manchurian Pika.

Ochotona hyperborea mantchurica, Thomas.

Ochotona (*Pika*) *hyperborea mantchurica*, Thomas, Ann. and Mag. Nat. Hist., Ser. 8, Vol. IV, pp. 500-505. Dec. 1909.

This subspecies was described from the Khingan Mountains as being most nearly allied to *O. hyperborea cinereo-fusca*, Schrenck, but decidedly larger, the skulls uniformly larger than those representing *cinereo-fusca* from the Ussuri. The colour is between cinnamon and russet, *cinereo-fusca* being true russet; sides and belly paler cinnamon, the latter vering into ochraceous buff.

I did not come across any pikas in the districts I visited, but it is possible that some form occurs on the Chang-pai Shan range.

*Reis. III, 1776, p. 692.

† Zoogr. Ross-Asiat I, 1831, p. 152

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VOLUME III.

BIRDS.

The thrush that carols at the dawn of day
From the green steeples of the piny wood;
The oriole in the elm; the noisy jay,
Jargoning like a foreigner at his food;
The blue-bird balanced on some topmost spray,
Flooding with melody the neighbourhood;
Linnet and meadow-lark, and all the throng
That dwell in nests and have the gift of song,

Do you ne'er think what wondrous beings these?
Do you ne'er think what wondrous beings
The dialect they speak, where melodies
Alone are interpreters of thought?
Whose household words are songs in many keys,
Sweeter than instrument of man e'er caught!
Whose habitations in the tree-tops even
Are half-way houses on the road to heaven!

PREFACE.

When the present work was first contemplated, it was intended to have but a chapter or two on the birds of Manchuria, dealing only with the species actually collected by the writer in that country. Later, when Mr. J. H. Riley, in response to a somewhat formidable request for a list of all the birds known to occur in Manchuria, made out such a list and sent it to the writer, the idea of preparing descriptions of all the birds, as well as a general account of the Manchurian ornithology took root, and the present volume is the result.

The describing of, and looking up references for, 458 species and subspecies of birds has been no light task, and it could never have been done without Mr. Riley's original list of 423 forms, frequent help and advice from Mr. J. D. de La Touche, the identification by Dr. Richmond and Mr. Riley, of the Smithsonian Institution, of the specimens of birds sent from China as well as from Manchuria, and the kind assistance of the members of the staff of the ornithological department of the British Museum in looking up the very wide literature upon the subject. To all these, including Dr. Percy Lowe, Mr. C. Chubb and Mr. Thomas Wells of the British Museum, the writer's sincere thanks and warm appreciation are tendered.

ARTHUR DE C. SOWERBY.

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Introduction.

The Birds of Manchuria.

Of all the many branches of Natural Science there is probably none more popular than that of Ornithology. Apart altogether from their scientific interest, birds have a tremendous appeal to humanity. They are "the world's happy children," as has been finely said, and, by their beauty of form, their vivacity, and their songs, bring happiness into the drab lives of countless human beings. The feathered forms that inhabit or visit our own native lands, whether in America or Europe, are all well known; while so vast and attractive a literature exists upon the subject that it is possible for anyone who has a taste for such things to take up the study of the more intricate problems of bird life, such as nesting haunts and habits and the problems of migration, and by his investigation add his quota to our knowledge of ornithology.

This, however, cannot be said of many other parts of the world, where much work still remains for the collector and museum naturalist to do in the discovery and describing of new forms, and in the demarkation of their habitats; and where conditions are such that observations on such phenomena as migration are extremely difficult to carry out at all systematically or effectively.

Though a great deal of work has been done in Asia, yet this continent belongs to the above category; and every fresh worker finds his hands full, merely to determine what birds occur in his region, while he often discovers new forms which need describing. What may be called the intensive study of Asiatic ornithology has scarcely begun.

The Manchurian Region, with which we are concerned in this book, belongs to Eastern Asia, and is one of those areas where the ornithologist has but scratched the surface, and where the nesting haunts of the birds, their times and seasons, and their migrations have scarcely been studied at all.

I have elsewhere mentioned the ornithologists who have been at work in this region, so will not repeat their names here.

In the course of my travels in that country, though I was concerned primarily with mammals, I found the avi-fauna so abundant and interesting, that I devoted a good deal of time to collecting specimens of the many species I came across, besides making many notes upon the subject. With the help of Dr. C. W. Richmond and Mr. J. H. Riley, of the Smithsonian Institution, to whom my specimens were sent for identification, frequent and useful correspondence with my good friend Mr. J. D. de La Touche, my own collections in the field, and reference to the somewhat extensive literature upon the birds of Eastern Asia generally, I have been able to get together a list of the birds known to occur, or that probably occur, in the Manchurian Region; and since the whole subject presents so much of interest to naturalists in general and ornithologists in particular, I have felt justified in going into it at considerable length in the present volume.

In dealing with the bird life of the Manchurian Region it is important to keep in mind its relationship with that of neighbouring countries or regions, for, as with other branches of animal life it will be found that so far from being distinct and individual, the avi-fauna of the Manchurian Region is a mixture of those of several other distinct bird-zones or avi-faunal sub-regions.

Dr. P. L. Sclater in a paper on "The Geographical Distribution of Birds" in the *Ibis* (*1891, pp. 514-557*) has made out a number of palæarctic bird sub-regions, of which the Siberian, Manchurian, Tartarian, and Oriental alone concern us. With the exception of the Manchurian sub-region, which my study of the ornithology of Eastern Asia leads me to conclude does not exist as such, I am inclined to agree with Dr. Sclater's divisions, but I would modify them to a certain extent. For instance, to speak of Manchurian birds is misleading. There is hardly a species, though there may be a few sub-species, and certainly not a single genus that belongs exclusively to Manchuria. The resident species that inhabit the country are either identical with or closely related to species from Siberia, neighbouring Mongolia, or North-eastern China, according to the area in which they occur. The migrants that breed in the country—and, incidentally, it may be stated that, Manchuria, being a well favoured country, attracts great numbers of these—all come from countries further south, as also do the birds-of-passage and

wild-fowl, which pass through every spring and autumn in millions. Though a great concourse of birds concentrates in the Manchurian Region at certain times of the year, giving us a list of 458 species and sub-species of which 150 may be considered as residents, a few as winter visitors, some 42 as marine birds, and the rest as migrants that breed in the country or visit it *en passant*—only the permanent residents can be called Manchurian, and, as already stated, these are not typical of that country alone. How, then, is it possible to talk of a Manchurian avi-faunal sub-region? Let us take a few of the resident species and examine their distribution. The hazel grouse (*Tetrastes bonasia*), of which a number of sub-species have been described, ranges from Central and Northern Europe right across Siberia into Manchuria, occurring in forested regions at least as far south as Southern Kirin. It is not met with in North-eastern China, which under Sclater's scheme of division comes in the Manchurian sub-region. The pheasants, about the various forms and names of which there exists a certain amount of confusion, cannot be considered as typically Manchurian, for they admittedly are characteristic of the Chinese avi-fauna, whence they have spread into Manchuria, Siberia and Mongolia, the latter being the eastern part of Sclater's Tartarian sub-region The blackcock, another resident species in Manchuria, extends from the British Isles as far as this; but not into North-eastern China. The great-black wood-pecker extends from Norway, right across Siberia to Manchuria and Saghalin Island, and is also found in North-eastern China and North Corea. The blue-magpie (*Urocissa brevivexilla*, Sw.), which occurs in the south-western part of Manchuria, is a Chinese bird, its range extending throughout North and Central China. In the west, where Manchuria borders Eastern Mongolia, we have the Mongolian lark, the bearded partridge, and Pallas' sand-grouse, all of which are Tartarian and do not occur in the forested areas of Manchuria. And so we could go on. The fact is, the resident birds of the forested areas—roughly Heilungkiang and Kirin—are Siberian in their affinities, while the birds of the open plains and unforested areas of the west and south are either Mongolian, or pertain to the avi-fauna of North-eastern and Eastern China.

In defining the limits of avi-faunal sub-regions we are confronted with many difficulties not met with in the case of mammal-zones or other faunal regions. Possessed of the power of flight,

which practically annihilates space as regards this earth, most birds are more or less migratory in their habits. The tremendous bird movement that takes place between the Arctic Circle and the Equator, or even the Southern Hemisphere, which sometimes follows a course diagonally across the meridians of longitude, makes it very difficult to set limits to the ranges of a great many species.

Even amongst those species that are classed as permanent residents, that is to say, those that are to be found in a given country all the year round, a certain amount of movement is noticeable from one place to another, which is governed by their food supplies or by the dictates of nature, when a safe retreat must be found for the processes of nidification, incubation, and rearing of young. As an example of this minor migration the pheasants of North China may be taken. During the winter they are to be found in large flocks in the foot hills and even on the plains adjoining the mountain ranges. As spring advances they retire into the security of the higher hills, working further and further away from the plains, many of them reaching the great mountain fastnesses, where the eggs are laid, the young hatched, and reared. As autumn approaches the families band together, and in large flocks work steadily down to the valleys and so out into the foothills and upon the plains again. This movement may be over a comparatively short distance, but it is a migration pure and simple, and has all the elements of the great journeys of such birds as, say, the *Charadriidæ*. In Manchuria we have examples of such a migration in the black-game and the nuthatch, both of which birds retire to the security of the Lesser Khingan Mountains to breed, subsequently spreading all through the low lying forest areas for considerable distances.

Nevertheless it is to these species that move, if they move at all, in a proscribed area, that we must first look to discover the limits of avi-faunal zones or subregions.

It will be found that the great avi-faunal sub-regions, though agreeing on the whole with those already defined as faunal sub-regions, nevertheless call for a certain amount of modification, though not to any very great extent.

We have the Arctic avi-faunal sub-region embracing the tundras and coasts of Northern Siberia, succeeded by the Siberian avi-faunal sub-region occupying Central and Southern Siberia,

Northern Mongolia, the Amur, the Primorsk, and the forested areas of Manchuria and North-eastern Corea.

The Japanese avi-faunal sub-region, which is usually considered as part of the Oriental region, may be said to embrace the southern half of Corea, the Island of Saghalin, the Japanese Islands themselves, and at least half of the Kuril Islands. In China we have a slight divergence from the faunal sub-region as laid down for other branches of animal life. Instead of having a North China avi-faunal sub-region it is necessary to create one for East China, occupying the provinces of Chihli, Shantung, Anhui, Kiangsu, Eastern Honan, and Northern Hupei. It extends into Manchuria, occupying a large part of Fengtien, including the south-west and south, and, of course, the Liao-tung Peninsula, and also North-eastern Corea. In passing it may be stated that North-western China shows affinities in its avi-fauna with those of both Mongolia and Thibet, while West-central and West China are distinctly Thibetano-Himalayan. The only other region with which we are concerned is the Mongolian one, being part of Sclater's Tartarian sub-region, and which we may call either by that name, or the Mongolian avi-faunal sub-region. It extends westward into Central Asia, and eastward just into Western Manchuria, taking in a part of Western and North-western Fengtien, North-western Kirin, and South-central and South-western Heilungkiang, all of which, in a manner of speaking, belong to the region referred to by early explorers as Dauria.

Arranging these sub-regions in tabulated form we have:

1. The Arctic sub-region: Northern coasts and tundras of Northern Siberia, including the extreme north-east and the coastline as far as Kamschatka.

2. The Siberian sub-region: The rest of Siberia, Northern and Western Mongolia, the forested areas of Manchuria and North-eastern Corea.

3. The Mongolian sub-region: The Gobi Desert, Eastern Mongolia, the Ordos Desert, parts of Northern Shansi, Shensi, and Kansu, Chinese Turkestan, Northern Thibet, and parts of Western Manchuria.

4. The East China sub-region: Part of Western Manchuria, South-western and Southern Manchuria, North-western

Corea, Chihli, Shantung, Anhui, Kiangsu, East Honan, and North Hupei.

5. The Japanese sub-region: Saghalin Island, half of the Kuril Islands, the Japanese Islands, and the southern half of Corea.

In order to assure the subsequent better understanding of the distribution of birds of the Manchurian Region it is necessary further to discuss some of these avi-faunal sub-regions. The Siberian sub-region extends roughly from the Urals in the west to Kamschatka in the east, and southward it embraces the Altai and Thian Shan Ranges, as well as Western Mongolia (Zungaria), and Northern Mongolia as far south as Urga. Almost the whole of the Amur basin comes within this sub-region, including the Sungari and Ussuri Rivers, which are tributaries of the Amur. In this extensive sweep of country it is not surprizing to find a number of more or less distinctive sub-areas in which the avi-faunas show certain distinctive features. Thus the Amur basin may be considered as a distinctive avi-faunal sub-area, cut off from the rest of the Siberian sub-region as it is by the Greater Khingan Mountains in the west, and the Yablonoi and Stenavoi Ranges in the north. The Baikal and upper basins of the Yenesei and Lena Rivers form another of these sub-areas, which meets that of the Amur on the Khingan Divide. A third is that which contains the Altai and Thian Shan Mountains and Western Mongolia; a fourth is the Yakutsk area, occupying the Alden and Middle Lena Valleys, meeting that of the Amur on the Yablonoi and Stenavoi Divides; while a fifth is the Kamschatkan sub-area, which includes some of the northern Kuril Islands. In connection with the last it may be stated that Stejneger points out in his paper "The Birds of the Kuril Islands" that these islands are the meeting ground of two faunas, namely the Japanese and Kamschatkan, and so are of unusual interest and importance.

In any one of the above defined sub-areas we are liable to find distinct subspecies, or at least distinct geographical races of the common resident Siberian species, as has been clearly shown by the work of Buturlin, and others in these regions.

In the succeeding chapters I am dealing with the birds that occur, whether resident or migratory, in the Manchurian Region, dividing them up into groups as follows: (1) permanent residents,

(2) migrants that breed in the country, (3) birds-of-passage and wild-fowl, and (4) marine birds. I prefer this arrangement to the one of going through the category from crows to divers or grebes usually pursued in books of ornithology, for it is not in the systematic way of the latter that we come to know the birds. Rather do we become familiar with them as they appear in their seasons or as we meet them on our travels. Thus in the spring we note the influx of migrants, which appear in such vast numbers and so great a variety, that we are almost overwhelmed, and we get to look upon certain species as purely spring birds. The hosts pass on, and leave certain species behind, which we find later going through all the activities of nest-building, the quiet of brooding and the subsequent rearing of families, and we become familiar with these as summer visitors or breeders in the country. Later the birds-of-passage return and pass southward, gathering in their train many of the birds we saw breeding, but leaving some behind, which we find stay with us all the winter, and these we call our resident birds. Later others are noted for the first time, and staying through the winter constitute our winter visitors.

We cannot think of any of our birds without instinctively assigning them to some special season; while many of the most interesting problems and phases of bird life are directly connected with the seasonal changes. This is why I have arranged my subject as indicated, though for the sake of system, an attempt is made to keep the birds as much as possible in their natural families and genera, as in use by modern ornithologists.

In this way, it becomes possible to deal with the various phases and problems in connection with bird life as they crop up, at the same time dealing individually with each species and subspecies. This is rendered easier than might at first be supposed by reason of the fact that in most cases the habits of a species are the habits of an entire family or group. Thus the gallinaceous birds, with the exception of the quails and sandgrouse, are all purely residential in their habits, remaining within more or less limited areas in the country the year round; while nearly all the *Sylviidæ* are summer visitors, only breeding in Manchuria. The *Charadriidæ* and other waders, or shore birds, on the other hand, are in the main, birds-of-passage.

In this way, it is possible to deal with the crows, most of the finches and woodpeckers, hawks, owls, and game-birds under the

general heading of residents; the warblers, flycatchers, swallows, swifts, cuckoos, kingfishers, and herons and their relatives as migrants that breed in the country; the cranes, plovers, curlews, snipe, and wild-fowl as birds-of-passage; and the gulls, skuas, auks, and the like as marine birds.

In dividing up the birds in this manner, there is only one difficulty, which lies in the fact that there are exceptions to every rule. What is to be done with birds whose habits do not conform to those of the majority of their kind? Are we to deal with the Japanese quail (*Coturnix japonica*), for instance, under the heading of migrants that breed in Manchuria, or with the rest of the game birds under the heading of resident species?

In cases where this occurs I have exercised my own discretion, generally dealing with the bird under the heading in which the majority of its relations are placed; but in families in which there are no very rigid seasonal habits, or in which there is a greater amount of variation in seasonal habits, I have classed the birds according to those habits in preference to their natural orders.

Thus the ducks and teal are classed together under the main heading of birds-of-passage, inspite of the fact that several species actually breed in Manchuria; while some of the buntings are dealt with as permanent residents, others as migrants that breed in the country.

Lest there should be any misapprehension on this score, however, I give below a list of the headings, and sub-headings, with the families under each, so that the reader may tell at a glance where to find any particular family, genus, or species.

Key to arrangement of birds as pursued in this book.

I. *Manchurian Region permanent residents*:—

A. Chapter I. Passerines and Picarians;—*Corvidæ*, *Paridæ*, *Crateropodidæ*, *Sittidæ*, *Certhiidæ*, *Troglodytidæ*, *Cinclidæ*, *Sylviidæ* (one species), *Prunellidæ*, *Fringillidæ*, *Ampelidæ*, *Alaudidæ* and *Picidæ*.

B. Chapter II. Birds of Prey,—*Strigididæ*,* *Pandionidæ*, *Falconidæ*, *Buteonidæ*, and *Vulturidæ*.

* The owls have been placed in the old category of birds-of-prey (Rapaceæ), rather than in their true place, i. e. in the Coraciformes, for convenience sake only.

C. Chapter III. Game Birds,—*Phasianidæ*, *Turnicidæ*, *Tetraonidæ*, *Pterocletidæ*, *Columbidæ*, and *Otididæ*.

II. *Migrant birds that pass through, or breed in, the Manchurian Region*:—

i, Birds that breed in Manchuria (summer visitors):—

A. Chapter V. Passerines,—*Oriolidæ*, *Sturnidæ*, *Emberizinæ*, *Motacillidæ*, *Laniidæ*, *Campephagidæ*, *Turdidæ*, *Sylviidæ*, *Muscicapidæ*, and *Hirundinidæ*, *Regulidæ*, *Prunellidæ*, *Dicruridæ*.

B. Chapter VI. Picarians, and other related families,—*Picidæ*, *Cuculidæ*, *Micropodidæ*, *Caprimulgidæ*, *Coraciidæ*, *Alcedinidæ*, and *Upupidæ*.

C. Chapter VII. Aquatic birds, *Ardeidæ*, *Ciconiidæ*, *Threskiornithidæ* (or *Ibidæ*), *Plataleidæ*, *Rallidæ*, *Colymbidæ* (or *Podicipetiæ*), *Gaviidæ* (*Colymbidæ*), *Phalacrocoracidæ*.

ii, Birds that pass through Manchuria (Birds-of-passage).

A. Chapter VIII. Birds-of-passage.—*Megalornithidæ*, *Charadriidæ*, *Glareolidæ*, *Haematopodidæ*, *Arenariidæ*, *Phalaropodidæ*, and *Scolopacidæ*.

B. Chapter IX. Wild-fowl.—*Anatidæ* (teal, ducks, geese, and swans).

iii, Marine birds that pass along the Manchurian Coasts to more northerly regions, or enter the rivers, breeding in the marshes, etc.

Chapter X. Marine birds,—*Procellariidæ*, *Alcidæ*, *Laridæ* and *Stercorariidæ*.

The method pursued in naming the birds in this work has been to give some easily understood popular name, the most up to date (at time of writing) scientific name, following such authorities as Hartert in his "Die Vögel der Paläarktischen Fauna," and then the earliest known name, authority and reference thereto.

ADDENDA

In the 1924 issue of *The Journal of the North China Branch of the Royal Asiatic Society* (Vol. IV, pp. 156-239) the Revs. Geo. D. Wilder and H. W. Hubbard publish a "List of the Birds of Chihli." This is the latest thing of its kind dealing with the birds of Eastern Asia, and the names used are the most up-to-date. As most of the birds contained in this list are also dealt with in the present work, which was written some time ago, before many of the present names had been adopted by such authorities as Hartert, whose "Die Vögel de Poläarktischen Fauna" had not yet been completed, I have decided to give here a list of those birds whose names do not agree in the two publications, my own and that of Wilder and Hubbard, so that the student of Chinese ornithology may be able to ascertain the latest accepted name for any given species.

	The Naturalist in Manchuria, by A. de C. Sowerby.	List of the Birds of Chihli Province, by G. D. Wilder and H. W. Hubbard.
Page	Name	Name
13	*Garrulus glandarius diaphorus*, La Touche.	*Garrulus glandarius pekingensis*, Reichenow.
15	*Pyrrhocorax brachypus*, (Sw.)	*Pyrrhocorax pyrrhocorax pyrrhocorax* (L.)
15	*Parus minor minor*	*Parus major wladiwostokensis*, Kleinschmidt.
16	*Periparus*	*Parus*
16 & 17	*Penthestes*	*Parus*
19	*Remizus*	*Anthoscopus*
23	? *Nannus fumigatus* (T. & S.)	*Troglodytes troglodytes idius* (Richmond).
40	*Emberiza godlewskii*, Tacz.	*Emberiza cia omissa*, Rothschild.
41	*Bombycilla garrulus* (L.)	*Bombycilla garrulus centralasiae*, Poljakow.
45 & 46	*Otocoris*	*Eremophila*

Page	The Naturalist in Manchuria, by A. de C. Sowerby. Name	List of the Birds of Chihli Province, by G. D. Wilder and H. W. Hubbard. Name
46	*Otocoris alpestris brandti*, Dresser	*Eremophila alpestris montana*, (Bianchi)
92	*Perdix daurica* (Pallas)	*Perdix barbata barbata*, Verreaux & Des Murs.
93	*Caccabis chukar pubescens*, Sw.	*Alctoris graeca pubescens* (Sw.)
94	*Turnix blanfordi*, Blyth	*Turnix tanki blanfordi*, Blyth
103	*Turtur*	*Streptopelia*
142-3	*Hirundo*	*Chelidon*
144	*Chelidon*	*Hirundo*
145	*Ptyonoprogne rupestris*	*Riparia rupestris*

Wilder and Hubbard in their "List of the Birds of Chihli Province" state that this species is a fairly common summer resident around the highest peaks and in deep gorges in the mountains everywhere.

145-7	*Acanthopneuste*	*Phylloscopus*
148	*Reguloides*	*Phylloscopus*
	Oreopneuste	*Phylloscopus*
149	*Horornis*	*Horeites*
151	*Lusciniola sinensis*	*Bradypterus pryeri sinensis*
151	*Tribura*	*Lusciniola*
152	*Locustella certhiola* (Pallas)	*Locustella certhiola artemisie* (Pallas).
157	*Oreocincla*	*Turdus*
158	*Cichloselys*	*Turdus*
162-3	*Petrophila*	*Monticola*
163	*Oenanthe*	*Saxicola*
164	*Saxicola*	*Pratincola*
165	*Ianthia*	*Tarsiger*
166	*Calliope*	*Luscinia*
167	*Erithacus*	*Luscinia*
	Larvivora	*Luscinia*
168	*Cyanosylvia*	*Luscinia*

Page	The Naturalist in Manchuria, by A. de C. Sowerby. Name	List of the Birds of Chihli Province, by G. D. Wilder and H. W. Hubbard. Name
168	*Terpsiphone*	*Tchitrea*
169	*Alseonax*	*Muscicapa*
170	*Hemichelidon*	*Muscicapa*
171	*Siphia*	*Muscicapa*
	Xanthopygia xanthopygia (Hay).	*Muscicapa narcissina zanthopygia*, Hay
172	*Poliomyias*	*Muscicapa*
	Cyanoptila cyanomelœna, (Temminck)	*Muscicapa cyanomelana cumilatis*, (Thayer and Bangs)
173	*Buchanga*	*Dicrurus*
175	*Anthus trivialis hodgsoni*, Richmond.	*Anthus trivialis maculatus*, Jerdon
177-8	*Budytes*	*Motacilla*
184	*Hypopicus*	*Dryobates*
186	*Hierococcyx*	*Cuculus*
188	*Micropus*	*Apus*
189	*Hirundapus*	*Chaetura*
198-9	*Nannocnus*	*Isobrychus*
199	*Butorides amurensis*	*Butorides striatus amurensis*
200	*Bubulcus coromandus*	*Bubulcus ibis coromandus*
202	*Pyrrherodias*	*Ardea*
203	*Herodias*	*Egretta*
205	*Platala leucorodia*, L.	*Platala leucorodia major*, T. & S.
207	*Gallinula chloropus*, (L.)	*Gallinula chloropus parvifrons*, Blyth.
208	*Limnobœnus*	*Porzana*
	Coturnicops	*Porzana*
208	*Porzana auricularis*, (Reichenow)	*Porzana pusilla*, Pallas
210	*Colymbus*	*Podiceps*
210	*Colymbus holbœlli*, (Reinhardt)	*Podiceps griseigena holbœllii*
211	*Colymbus philippensis*, (Bonnat)	*Podiceps ruficollis poggei* (Reichenow)

The Naturalist in Manchuria, by A. de C. Sowerby.		List of the Birds of Chihli Province, by G. D. Wilder and H. W. Hubbard.
Page	Name	Name
212-14	*Gavia*	*Colymbus*
212	*Gavia septentrionalis* (L.)	*Colymbus stellatus* Pontoppidan
214	*Phalacrocorax carbo* (L.)	*Phalacrocorax carbo subcormoranus* (Brehm)
222	*Pseudogeranus leucauchen* (Temminck)	*Megalornis vipio* (Pallas)
222	*Leucogeranus*	*Megalornis*
223	*Megalornis grus* (L.)	*Megalornis grus lilfordi* (Sharpe)
225-6	*Ægialitis*	*Charadrius*
225	*Ægialitis alexandrina* (L.)	*Charadrius alexandrinus dealbatus*, Swinhoe
226	*Ægialitis dubia* (Scopoli)	*Charadrius dubius curonicus*, Gmelin
227	*Ochthodromus geoffroyi* (Wagler)	*Charadrius leschenaultii* Lesson
227-8	*Ochthodromus*	*Charadrius*
230	*Squatarola squatarola*	*Squatarola squatarola hypomelæna* (Pallas).
232	*Glareola orientalis*, Leach	*Glareola maldivarum* Forster
234	*Himantopus candidus*, Bonnat	*Himantopus himantopus himantopus* (L.)
239	*Lobipes*	*Phalaropus*
244	*Gallinago solitaria japonica*, Swinhoe	*Gallinago solitaria*, Hodgson
246	*Rostratula capensis* (L.)	*Rostratula benghalensis benghalensis* (L.)
247	*Limicola platyrhyncha* (Temminck)	*Limicola falcinellus sibirica*, Dresser.
248	*Pelidna*	*Erolia*
249	*Tringa canutus*, L.	*Erolia canutus rogersi* (Mathews)
250	*Tringa crassirostris*, T. & S.	*Erolia tenuirostris* (Horsfield)

Page	The Naturalist in Manchuria, by A. de C. Sowerby. Name	List of the Birds of Chihli Province, by G. D. Wilder and H. W. Hubbard. Name
250	*Erolia subarquata* (Güldenstadt)	*Erolia ferruginea* (Brünnich)
251-2	*Pisobia*	*Erolia*
252	*Pisobia damacensis* (Horsfield)	*Erolia subminuta* (Middendorff)
253	*Calidris arenaria* (L.)	*Crocethia alba* (Pallas)
254	*Glottis*	*Tringa*
255	*Pseudototanus*	*Tringa*
256	*Actitis*	*Tringa*
257	*Heteractitis brevipes*	*Tringa incana brevipes*
257	*Helodromus*	*Tringa*
258	*Rhyacophilus*	*Tringa*
258	*Totanus calidris* (L.)	*Tringa totanus eurhinus* (Oberholser)
259	*Totanus fuscus* (L.)	*Tringa erythropus* (Pallas)
	Totanus	*Tringa*
263	*Mesoscolopax*	*Numenius*
270	*Mergus merganser* L.	*Mergus merganser orientalis*, Gould
276	*Oidema stejnegeri*	*Oidema fusca stejnegeri*
277	*Harelda*	*Clangula*
280	*Clangula*	*Bucephala*
280-3	*Marila*	*Nyroca*
284	*Querquedula*	*Anas*
285-6	*Nettion*	*Anas*
288	*Eunetta*	*Anas*
289	*Chaulelasmus*	*Anas*
	Mareca	*Anas*
290	*Dafila*	*Anas*
291	*Polionetta zonorhyncha*	*Anas poecilorhyncha zonorhyncha*
292	*Anas boschas*, L.	*Anas platyryncha platyryncha*, L.
293	*Casarca rutila*, (Pallas)	*Casarca ferruginea*, (Pallas)
295	*Aex*	*Aix*

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300	*Chen hyperboreus hyperboreus* (Pallas)	*Anser caerulescens caerulescens* (L.)
301	*Anser rubrirostris* Hodgson	*Anser anser* (L.)
304	*Anser segetum*, Gmelin	*Anser fabalis fabalis* (Latham)
	Anser middendorffi, Swertzoff	*Anser fabalis sibiricus* (Alphéraky)
306-8	*Olor* and *Euolor*	*Cygnus*
325	*Larus canus*, Brünnich	*Larus canus major*, Middendroff
	Larus vagæ	*L. argentatus vegæ*
324	*Larus glaucus*, Brünnich	*Larus hyperboreus*, Gunnerus
326	*Larus cachinnans*	*Larus argentatus cachinnans*
330	*Sterna sinensis*	*Sterna albifrons sinensis*
331	*Sterna fluviatilis*, Naumann	*Sterna hirundo hirundo*, L.
332	*Hydroprogne caspia* (Pallas)	*Hydroprogne tschegrava tschegrava* (Lepechin)
332	*Hydrochelidon leucoptera grisea* (Horsfield)	*Hydrochelidon leucoptera* (Temminck)
333	*Hydrochelidon hybrida* (Pallas))	*Hydrochelidon leucopareira swinhoei* Mathews

CHAPTER I.

Manchurian Region Resident Birds

Passerines and Picarians.

Birds . . . . . .
Teach us while they come and go,
When to sail and when to sow.
Cuckoo calling from the hill,
Swallow skimming by the mill,
Starlings swirling from the hedge,
Mark the seasons, map our year,
As they show and disappear.

—*Matthew Arnold.*

CHAPTER I.

Manchurian Region Resident Birds.

Passerines and Picarians.

Before going into a detailed account of the birds themselves it would be as well to define exactly what is here meant by the term 'resident birds'. For my part I consider a bird that belongs to a species or subspecies that is found in a given country in both winter and summer as constituting a resident in that country. There is one objection, however, that may be raised to this definition, and that is that by it many species that are undoubtedly migratory in part will be included in the list of residents. In many species of birds there is a migration over a more or less limited area, while in others some of the individuals are migratory, others residing in one area all the year round. The first case is noticeable amongst some of the passerines, or perching birds, such as the larks and buntings. Birds that winter in one area going north to breed, their places being taken by others of the same species that wintered a good deal further south. The second case obtains to a considerable extent amongst the birds of prey, such as owls and hawks, or falcons, some individuals of a given species following the migrations of smaller birds from one region to another, others remaining in a given region or district the year round. Are these to be called residential in regard to that given country, region, or district, or are they to be called migrants? Under my definition they come under the category of 'resident birds', and as such I intend to deal with them, leaving the further pursuit of the discussion to such as care to take it up. The migrants I am going to consider under two groups, (1) those that appear in the country only in summer, and breed in the country, which I shall call summer visitors, and (2) those that pass through the country and do not stop to breed, and may be called birds-of-passage. There is one other type of bird, namely, that which only winters in the country, which may be called winter visitors, but there are so few of these that it is

impracticable to deal with them under a separate group, and so, in accordance with the scheme laid down in the introduction, they will be classed with the other members of their families.

It must not be thought that I am not alive to the importance of all migrations; I am, and where a species is partially migratory I shall invariably state the fact in dealing with it.

Under my definition it is possible to include no less than 152 species and subspecies in the list of residents in the Manchurian Region. These include the crows (*Corvidæ*), the tits (*Paridæ*), the babblers (*Crateropodidæ*), the nuthatches (*Sittidæ*), the creepers (*Certhiidæ*), the dippers (*Cinclidæ*), one species of *Silviidæ*, the accentors (*Prunellidæ*), the finches (*Fringillidæ*), the waxwings (*Ampelidæ*), the larks (*Alaudidæ*), the woodpeckers (*Picidæ*), the owls (*Strigididæ*), the osprey (*Pandionidæ*), the falcons (*Falconidæ*), the buzzards, eagles, harriers, and hawks, (*Buteonidæ*), the pheasants, partridges and quails (*Phasianidæ*), the button-quail (*Turnicidæ*), the grouse (*Tetraonidæ*), the sand-grouse (*Pterocletidæ*), the doves (*Columbidæ*), and the bustard (*Otididæ*).

This is a long and interesting list, and it serves to show what an extensive avi-fauna is to be met with in our region.

Passerines.

Family Corvidæ.

The crow family consists in the Manchurian Region of some 19 species and subspecies. Though many of them are partially migratory, the majority of the members of each species both breed and winter in the region, though not all of them remain in the same locality throughout the year. Many of them, such as the crows, jackdaws and rooks, go in for extensive migrations within a more or less limited area, either from north to south, or else from the mountainous districts, where they breed, to the plains, or even to the sea-board. The crows and jackdaws of these regions especially gather into immense flocks, scouring the country by day for food, and returning to the large towns at night to roost on the roofs of the houses, or in the shelter of trees.

Some of the crows and the rooks migrate in the truest sense, leaving the region in the autumn and wintering as far south as the Yang-tzu Valley.

Other species such as the jays keep to the forested areas the year round; while the magpies keep to the open hills and plains, and do not appear to migrate at all.

1. Ussurian Raven.

Corvus corax ussurianus, Taczanowski.

Corvus corax ussurianus, Taczanowski, Mem. Acad. Imp. Sci., St Peters., Series VII. Vol. 39 p. 527, 1891-1893.

The forested areas of Manchuria and neighbouring regions are inhabited by a very large and handsome raven, to which Taczanowski gave the name of *Corvus corax ussurianus*. Its chief claim to distinction is its size, as it is a little larger than Taczanowski's subspecies *C. c. sibiricus* from further west in Siberia.

Buturlin writing on the birds of the Ussuri gives it as *C. c. kamtschaticus*, Dybowski, but the bird I secured in the forests north of I-mien-p'o was identified at the Smithsonian Institution with Taczanowski's form, that described by Dybowski from Kamschatka being considerably larger. In any case these eastern forms are only subspecies of the European bird, which they all resemble in appearance.

2. Eastern Carrion-Crow.

Corvus corone orientalis, Eversmann.

Corvus orientalis, Eversmann, Dybowski, Journ. für Ornith. p. 329, 1874.

The carrion crow is common in most of the unforested parts of Manchuria, except during the breeding season, when it appears to seek the shelter of the mountainous regions, retiring into the extreme north of the Manchurian Region and even into Siberia beyond the Yablonai Mountains. I saw large flocks of these birds on the Manchurian plains in the autumn, and a few in the hills along the Yalu River in the late spring, and on the Upper Sungari in mid-summer. I saw it in winter round I-mien-p'o, and also on the western plains, so that it may honestly be called a resident species. I found it breeding in the Tung Ling area of north-eastern Chihli.

It is of a fine glossy black like its relative of Europe.

It builds its nest in the tops of tall pines or other conifers, usually in mountainous and forested areas.

3. Manchurian Jungle-Crow.

Corvus macrorhynchos mandshuricus, Buturlin.

Corvus macrorhynchos mandshuricus, Buturlin, Messager Ornith. No. 1, p. 40, 1913.

The jungle-crow is at once recognizable by its enormous bill, which feature, in fact, gives it its specific name of *macrorhynchos*. There appear to be several forms scattered throughout Eastern Asia, which differ but little from one another, and are separable mainly on their geographical distribution.

The Manchurian subspecies is about the same size as the rook; a little smaller than the carrion crow. Its feathers lack the glossy sheen of the latter. The tail is long and wedge-shaped as in the raven.

The form occurring in the Manchurian Region is Buturlin's *Corvus macrorhynchos mandshuricus*. Ingram recorded it as *C. m. japonensis*, but his specimens were secured before Buturlin described his subspecies.

In habits the jungle-crows combine the characteristics of the carrion-crow with those of the rook. They frequent the haunts of man, building their nests in communities in the precincts of towns and villages, just as do the rooks of these parts, though some individuals repair to mountainous and wooded areas to breed. Unlike the rooks, which seek their sustenance chiefly in the open country, the jungle-crows act as scavengers, and in their impudent and thieving ways resemble the carrion crows. Wherever they settle they form a noisy and thieving rabble. As a class they are more migratory than the carrion crow, in which particular they agree again with the rooks. I do not remember seeing any in Manchuria during the late winter, though they were plentiful in the I-mien-p'o district after the first snow had fallen.

La Touche records *C. m. levaillanti*, Less., the Chinese jungle crow, as the form occurring at Chin-wang Tao in North-eastern Chihli, and if his identification of this bird is correct, it is probably the occupant of South-western Manchuria.

4. The Collared Crow.

Corvus torquatus, Lesson.

Corvus torquatus, Lesson, Trait. d'Orn. p. 228, 1831.

The handsome collared crow may at once be recognized by its broad, white collar and white breast; the rest of the plumage being

a glossy black. This bird is a resident of all flat districts in North China, though in the Yang-tzu Valley, and South-east China, it appears to inhabit hilly country as well.

There appears to be but one form, which I have noted from the Si-an Fu plain in Shensi to the Mukden plain in South-western Manchuria. It does not occur further north or east than this. In Shansi it occurs on the Tai-yuan Fu plain at an altitude of 2600 ft. above sea level.

It seems to take the place in these parts of the hooded crow (*C. cornix*) in Europe, indeed, if the white in its plumage were replaced with grey, it would be almost identical with the latter bird, which it about equals in size.

Mr. La Touche found the collared crow breeding in Fukien Province. He says of the nest: "It is composed of sticks, some of which are of considerable size, with an inner layer of finer twigs, and a lining of dry grass and pine-needles." Of the eggs he writes: "very variable in size, shape and colour. The ground colour is a light green or bluish green more or less blatched, spotted or speckled with sap-green, and there are generally underlying spots of dull reddish-grey, or violet grey." In size the eggs vary from $1\frac{1}{2}$ inches to $1\frac{5}{8}$ inches in length, and $1\frac{1}{8}$ to $1\frac{1}{4}$ inches in width.

5. Eastern Rook.

Corvus frugilegus pastinator, Gould.

Corvus pastinator, Gould, Proc. Zool. Soc. Lond. p. 1, 1845.

It is somewhat doubtful if the rook is a truly permanent resident in Manchuria; but even if it does not reside in any part of the Manchurian Region throughout the whole winter, it certainly appears very early in the spring, and stays very late in the autumn. Mr. La Touche records the passage of rooks from Manchuria along the Chihli Coasts as late as October, and from Chihli towards Manchuria as early as February 20th. I am inclined to the belief that members of this species may be found in the coastal areas of South Manchuria throughout the winter, but the point needs verification.

In any case the rook is probably the most migratory of all the *Corvidæ* in these regions.

It nests chiefly in the vicinity of towns and villages, where it usually resorts to the large acacias, elms and even poplars. The eggs are about 1½ inches in length by 1¼ inches in diameter, and are of a pale greenish colour mottled with brown. There are usually four in a clutch.

The rook may always be recognized by the naked whitish face in the adult. The eastern bird has a purplish sheen to its glossy black plumage.

6. Daurian Jackdaw.

Colœus davuricus (Pallas)

Corvus davuricus, Pallas, Reis. III, p. 694, 1776.

This handsome little jackdaw with its black and white plumage occurs in Manchuria chiefly in the unforested areas. Being, like most of the family, partially migratory, it leaves the northern parts, and high mountainous country, where it breeds in the cliffs, at the approach of winter, and takes up its residence on the plains and along the sea-board, associating with the carrion crows in immense flocks.

La Touche records it in his notes upon the migrants that pass Chin-wang tao, on the Chihli Coast, near the Manchurian border. I saw it breeding along the chiffs of the Yalu River in South Manchuria. It thus forms a typical example of the birds that migrate over a more or less limited area, and it is evident that those birds that breed in South Manchuria migrate to North China for the winter, others that breed in, say, the Khingan Mountains taking their place in South Manchuria during the winter.

In size this bird about equals the British species. The head is black, with a bluish sheen; the cheeks are streaked with white or grey; the throat, upper breast, wings, back and tail are the same glossy black with bluish sheen as the head: a white band extends from high up on the back of the head down the sides of the neck to the lower breast, which, with the belly, is entirely white: bill and legs, black: eyes, brown.

It is extremely common throughout North China, Southern Mongolia, and South and West Manchuria.

7. Black Jackdaw.

Colœus neglectus, Swinhoe.

Colœus neglectus, Swinhoe, Ibis, pp. 259 and 387, 1861.

This bird differs from the foregoing in being entirely black, and slightly smaller. In habits and range the two species are identical, nesting in the same areas, and often associating with each other in winter. The members of the black species are decidedly fewer in number.

8. Chinese Magpie.

Pica pica sericea, Gould.

Pica sericea, Gould, Proc. Zool. Soc. Lond., 1845, p. 2.

There appear to be two forms of the common magpie in the Manchurian Region. That inhabiting the plains and hills of the west and south is referrable to Gould's subspecies *Pica p. sericea*, and that occurring to the north and east, that is, the more forested areas, to Bonaparte's *P. p. bactriana;* at least so I am led to conclude from the identification of specimens sent by me to the Smithsonian Institution. That there are grounds for separating these two forms from each other and from the common European form, *P. p. pica*, L., is evident, though it must be admitted that they are all very closely similar to each other.

The magpie holds in Chinese and Manchurian ornithology a unique position, not by reason of any peculiarity of its own, but because of what may be called its historical associations with the late ruling dynasty, the Manchus. In the story of the miraculous origin of the progenitors of the line of Manchu Emperors, it was a magpie that placed a fruit upon the clothes of Fokolun, the heavenly maiden, who by eating the fruit conceived and gave birth to Aisin Gioro. Again it was a magpie that perched upon the head of Fancha, Aisin Gioro's son, when that young man was fleeing from his father's murderers, and so led them into the belief that the fugitive was a tree stump, thereby saving his life.

Thus the bird is known to the Chinese as the *Shi Ch'iao*, or 'bird of happiness,' and is considered lucky and of good omen, and by the Manchus as their sacred bird. On this account it is seldom wantonly killed by the natives, and so has become exceedingly abundant in both town and country.

Building its domed nest, often in low trees in close proximity to buildings, the magpie is a resident of the most pronounced type. It is omnivorous in its diet, acting the parts of scavenger, vermin destroyer or thief with equal readiness. Next to the sparrow it is the commonest bird in North China and those parts of Manchuria where it occurs.

Almost identical in appearance with the European bird, its distinguishing features are the broad black edges to the primaries, and the fact that the rump is usually grey, seldom white.

9. Eastern Magpie.

Pica pica bactriana, Bonaparte.

Pica pica bactriana, Bonaparte, Consp. Gen. Av., Vol. I, p. 383, 1850.

I secured specimens of this form on the Lower Sungari River. Hartert gives its range as North Asia extending across Siberia to the Ussuri and Kamschatka.

It is distinguished by having the rump always white, the black edges of the primaries narrow, and the white extending further towards the tip than in *sericea*.

10. Azure-winged Magpie.

Cyanopica cyana cyana, (Pallas)

Corvus cyana, Palls, Reis. III, p. 694, 1776.

This bird, which occupies Manchuria, as well as Siberia, differs from the Chinese *Cyanopica swinhœi* in being a little larger and more brightly coloured.

With its black head, bill and legs, mauve-grey back, grey-white breast, and pale blue-grey wings and tail, this is one of the most beautiful of the birds of this region. It is somewhat smaller than the common magpie.

Its lively habits and graceful movements make it a specially attractive bird.

Though it visits human habitations its place is in the country, where at all times of the year, excepting during the nesting season, it moves about in flocks of from ten to thirty individuals, as it searches for its food. It will eat anything from fruit to carrion.

In Manchuria it occurs in the forest regions, though it keeps to the open glades and river valleys. It is also common is winter on the plains where trees occur.

In a recent paper in *The Ibis* La Touche refers the North-east Chihli birds to Hartert's *C. cyanus interposita*,* which form may thus occupy South-west Manchuria.

11. Chinese Blue Magpie.

Urocissa erythrorhyncha brevivexilla, Swinhoe.

Urocissa brevivexilla, Swinhoe, Proc. Zool. Soc. Lond., 1873, p. 688.

The blue magpie when in full plumage is if anything even more handsome than the azure-winged magpie. The head, throat, and upper breast are black, the crown and nape being streaked with pale mauve: the back is mauve-grey; the lower breast and belly grey-white; the wings are tinged with a beautiful shade of mauve-blue, as also is the long graceful tail; the feathers of the latter being banded towards their tips with black, and ending in white; the bill and legs are of a fine red colour, the eyes brown, with orange-red eyelids.

Not only is the bird possessed of a beautiful appearance and graceful movements, it also has a melodious voice, which may be heard in spring during the mating season.

It occurs in Manchuria only in the extreme south-west, where it lives in the mountains that extend into that country from North-eastern China.

Like the other pies it is omnivorous. In size it about equals the common magpie, though its tail is very much longer. It is non-migratory.

In observing the habits of this bird I have been struck by its restlessness, sagacity and fearlessness. It frequents mountain valleys almost exclusively, and is never found for from running water.

12. Nutcracker.

Nucifraga caryocatactes macrorhynchos, Brehm.

Nucifraga macrorhynchos, Brehm, Lehrbruck Eur. Vögel, I, 1828, p. 103.

The nutcracker is a somewhat rare bird in the Manchurian Region. I saw but three during the whole of my explorations in the Manchurian forests. It is essentially an inhabitant of the forests, more especially forested mountains.

* Nov. Zool., Vol. XXIV, p. 493, Dec. 1917.

In China a distinct form, *N. hemispila macella*, Thayer and Bangs, occurs, in which the outside tail feathers, or retrices are wholly white, not half white and half black as in *N. c. macrorhynchos*. In other respects the Chinese and Manchurian forms are very much alike.

The head, back, breast, and wing-coverts are brown, the head neck and upper back being covered with white pear-shaped spots: the wings and tail are black, the outside feathers of the latter being black at the base and white for the distal half: legs and bill are black, the eye brown.

The nutcracker is a lively bird, whose favourite perch is the topmost sprey of some coniferous tree such as spruce or larch. It has a loud, trilling call, which it utters at frequent intervals, especially when it catches sight of human intruders upon the solitudes of its haunts. An interesting bird to watch, it soon becomes very tame in captivity.

H. E. M. James secured specimens in the Chang-pai Shan district, I saw two in the West Kirin forest and one in the I-mien-p'o district of North Kirin.

La Touche records this species as occurring in North-eastern Chihli.

13. Brandt's Jay.

Garrulus glandarius brandtii, Eversmann.

Garrulus brandtii, Eversmann, Add. ad. Pallas, Zoogr., Fasc. III, p. 8, 1843.

Some interest has been roused recently in respect to the jays of China and Manchuria by the discovery of a new and distinct form in North-eastern Chihli, which was described by Mr. La Touche, under the name *Garrulus diaphorus*. This is an intermediate form between our present subspecies *G. glandarius brandtii*, which occupies Siberia and the forested areas of Manchuria, and the Central China species *G. sinensis*.

It appears that both *brandtii* and *diaphorus* belong to the *G. glandarius* group, and should be considered as subspecies of that form, though they were originally described as full species.

G. g. brandtii is a large, handsome bird altogether more richly coloured than the more western forms, both Chinese and European. It is of a general vinous-grey colour; the head is heavily streaked

with black; the blue, barred patch on the wing is small, the speculum, which lies behind it being nearly all white; the lower back is whitish; the part round the eye black. A point in which the Manchurian birds differ from those from Siberia is that the forehead in the former is whitish, in the latter of the same foxy red as the rest of the crown. However, my Manchurian specimens have been referred to Eversmann's subspecies.

The jay is an inhabitant of the forest areas, being particularly plentiful in the North Kirin district. In habits it agrees with the European species. Its food consists chiefly of berries, wild grapes being particularly liked.

14. North China Jay.

Garrulus glandarius diaphorus, La Touche.

Garrulus diaphorus, La Touche, Bull. B. O. C., 1915, Vol. XXXV, p 98.

As already stated this species is intermediate between the Central China jay, *Garrulus sinensis*, Gould, and the Siberian form *G. g. brandtii*. That it may be listed with the birds of Manchuria is evidenced by the fact that it has been secured in the mountains to the north of Chin-wang Tao, close to the Sino-Manchurian frontier, and it seems probable that along with so many other birds and animals of this district it intrudes into South-western Manchuria. It has not yet been taken actually on Manchurian soil, however.

It is distinguishable from *brandtii* in being lighter, more fox-red in general colour, in having the crown without any streaks, and the primaries edged with whitish. The speculum is a great deal less white, in some specimens entirely blue and black barred. The region round the eye has no black.

G. sinensis is still paler, has only the apical half of the primaries edged with whitish, and is altogether more red and less vinous than either of the other two forms, while the speculum is entirely barred blue.

The exact range of *G. g. diaphorus* is not as yet known. I have seen jays in West Shansi, but have never succeeded in securing specimens, as they are somewhat rare. To which, if either, of the two forms *diaphorus* or *sinensis* they belong it is impossible to say. I secured a specimen of *diaphorus* in the Tung Ling

(Eastern Tombs) forested areas, north-east of Peking, which so far constitute the known western limit of its range. Eastward it cannot extend much beyond the Manchurian border.

15. Siberian Jay.

Perisaureus infaustus maritimus, Buturlin.

Perisaurus infaustus maritimus, Buturlin, Messager Ornith., Vol. IV, p. 113, 1915.

The Siberian jay, recorded by Buturlin from beyond the Ussuri region, is one of those species, typical of the Siberian avi-faunal sub-region, which spreads into the Manchurian Region. It has not been recorded from Corea or China. The subspecies, which differs from true *infaustus* of Scandinavia in having a darker cap, is nevertheless nearer to this form than to *sibiricus* from Yakutsk. It is also larger than true *infaustus*.

The head and nape are dark brown; the throat and breast grey; the back dull grey suffused with reddy-brown; the flanks, belly, rump and tail are a bright rufous colour; there is a buff patch at the base of the bill on the upper side.

The nest is usually built high up on a pine. Four eggs are usually laid, being of a dirty white, blotched with grey-brown.

I saw what I took to be this bird in the forested area of I-mien-p'o, North Kirin.

Hartert gives *P. infaustus sibiricus* (Bodd) as the form inhabiting the Amur and Saghalin, but there is no doubt about Buturlin's form being genuine, as a comparison of specimens in the British Museum plainly shows.

16. Saghalin Jay.

Perisaureus infaustus sakalinensis, Buturlin.

Perisaureus infaustus sakalinensis, Buturlin, Mess. Orn., 1916, pp. 40 and 43.

This is a smaller subspecies of true *infaustus* than the foregoing, and is distinguishable by its generally darker colour. The crown and nape are almost black, much darker than in *maritimus;* the rufous colour of the upper wing-covert is richer, as also is that of the tail. It inhabits Saghalin Island.

17. Short-toed Chough.

Pyrrhocorax brachypus, (Swinhoe).

Fregilus graculus, var. *brachypus*, Swinhoe, Proc. Zool. Soc. Lond., 1871, p. 383.

Though not actually recorded from Manchuria, this chough occurs in North-east Chihli, where La Touche has secured specimens close to the Manchurian border, so that it most probably occurs actually in the latter country.

Of black plumage, this bird has the rather long, slender, and curved bill, as well as the legs orange-red. It differs from *graculus* in having shorter toes. It is a graceful bird, slightly smaller than the rook, with longer wings than is usual in the crow family.

It nests in holes and crevices in cliffs; and is non-migratory.

Family Paridæ (Tits).

The tit family contains some nine species and subspecies that occur in the Manchurian Region. One of these, *Remiz pendulinus consobrinus*, Sw., the so-called penduline tit, appears to be a migratory species, and as far as I have been able to ascertain does not occur in our region in winter. As all the others are both summer and winter residents, though some of them undoubtedly go in for a partial migration, I have decided to deal with the penduline tit here. As a family the tits are too well known to require any description.

18. Lesser Tomtit.

Parus minor minor, Temminck and Schlegel.

Parus minor, T. and S., Fauna Japonica, Aves., p. 70, pl. XXXIII, 1850.

This tit, which is given by Hartert as a subspecies of the European great tit (*Parus major*), in reality appears to represent a distinct group of Asiatic and South-east European tits, of which *P. cinereus* is another member, and all of which are characterized by a dirty, or greyish, white breast instead of the yellow so characteristic of the great tit. Indeed Collingwood Ingram appears to have been of the same opinion, for he records our form as *Parus cinereus minor* as having been taken in the Pei-shan Forest, Kirin, in 1886.

In this bird the top of the head, sides of the neck, throat, upper breast, and a line down the middle of the breast are of a shiny black; the cheeks, back of the head, outer web of the two outer tail feathers, and a bar across the wings, white; the back and mantle a dull greyish-green; the wings and tail bluish grey, with the inner webs of the quills dusky-black; the lower breast a dirty white; and the bill and legs black.

The species is very common throughout Manchuria and North-east China.

19. Hellmayer's Coal-Tit.

Periparus ater insularis, (Hellmayer).

Parus ater insularis, Hellmayer, Orn. Jahrbuch, XIII, p. 36, 1902.

Though in the list of Manchurian birds prepared for me by Mr. J. H. Riley David's coal-tit (*P. a. pekinensis*) is given as the species occurring there, it appears that Hellmayer's species, *P. a. insularis*, is more likely to be the Manchurian form. Mr. La Touche finds that this species replaces David's *pekinensis* at Chinwang Tao, which lies between Peking and Manchuria, and it is hardly likely that the Peking form should reappear in Manchuria. *P. a. insularis* apparently ranges right up into Northern Siberia, where the members of the Russian Arctic Expedition (1900-1903) found specimens in September far beyond the forest area.

It has the crown, back of head, and throat shiny black; cheeks, sides of neck, and nape white; mantle blue-grey, suffused with olive green on the rumps; underparts dirty white, but much clearer than in *pekinensis*. It further differs from *pekinensis* in having only a very slight crest and in being somewhat larger.

20. Thick-billed Marsh-Tit.

Penthestes palustris crassirostris (Taczanowski).

Poecilia palustris crassirostris, Taczanowski, Bull. Soc. Zool., France, X, 1885, p. 470.

The marsh-tit that occurs in the Ussuri region, as its name suggests, is characterized by having a thicker bill than the other forms, though in other respects it is similar. James secured a specimen in 1886 at Chang-tsai-ling, 80 miles east of Kirin. Otherwise this little bird resembles the British form *P. palustris* in

general appearance, that is to say, it has the cap and throat black, the upper parts greyish buff-brown, the cheeks white, the under parts greyish white, the wings and tail greyish dusky. Bill black; legs greyish.

21. Short-billed Marsh-Tit.

Penthestes palustris brevirostris, (Taczanowski).

Poecilia brevirostris, Taczanowski, Journ. F. Orn., 1872, p. 444.

According to Ingram this bird has a slightly browner back than the other subspecies of these regions, and also a faint metallic, or steely sheen on the back of the head. It is further characterized by a short bill, and in having the wing feathers distinctly margined with greyish white.

Specimens were taken in the Khingan Mountains in April and May, and reported by Ingram.

22. Hellmayr's Marsh-Tit.

Penthestes palustris hellmayri, (Bianchi).

Parus palustris hellmayri, Bianchi, Annuaire Mus. Zool. Acad. Imp. Sci., St.-Péterb., VII, 1902, p. 236.

This is a third species of marsh-tit described from the Manchurian Region, apparently from the more westerly and forested areas, where the specimens upon which Bianchi worked were collected.

It has the crown and nape black; cheeks white; throat black speckled with white; upper parts dull grey-brown, under parts dirty white.

23. Baikal Marsh-Tit.

Penthestes montanus baicalensis, (Swinhoe).

Poecile baicalensis, Sw., Ann. and Mag. Nat. Hist., Ser. 4. VII, 1871, p. 1871.

Specimens of marsh-tits, which I collected in the I-mien-p'o district of North Kirin, have been referred to Swinhoe's species from further west; thus bringing the number of Marsh-tits recorded from the Manchurian Region up to four. It is difficult to believe

that so many different forms occur. But Ingram, who appears to have had a number of specimens from different parts to examine and compare, has admitted three forms, the present, and Taczanowski's two forms—*Penthestes montanus baicalensis*, *P. palustris crassirostris*, and *P. p. brevirostris*, respectively,—all very much alike but differing as described. *P. m. baicalensis* is the largest of the three, and *P. p. crassirostris* the smallest. Bianchi's form *P. p. hellmayri* is the most doubtful, but it seems to show slight differences in its plumage.

As Ingram records *baicalensis* from the Khingan Mountains, as well as *brevirostris*, it would appear that these two forms occur in the west, *crassirostris* in the east, and *hellmayri* in the south.

In its plumage *baicalensis* scarcely differs from *crassirostris* and *brevirostris*, though the wing feathers are not margined with greyish-white and it lacks the steely sheen on the back of the head.

24. Long-tailed Tit.

Aegithalus caudatus caudatus (L.)

Parus caudata, L. Syst. Nat. 1, p. 342, 1766.

The long-tailed tit that occurs in the forested areas of the Manchurian Region appears to be identical with the European form. It is unmistakable when seen, and though I did not secure specimens, I saw it several times in the various parts of the Manchurian forest.

The head, breast, and lower parts are white; the mantle is black, merging into light vinous on the sides and lower rump; the wings are black, the secondaries broadly edged with white; the tail feathers are black, the outer three on each side edged with white; the bill and legs are black.

The members of this species move about, except in the incubating and breeding period, in large flocks, scouring the bushes and lower shrubs for their food. They are very lively and quick in their movement, and are exceedingly interesting to watch.

Sir Evan James records this species under the generic name of *Acredula* as having been taken by him when travelling through Manchuria in 1886.

25. Manchurian Crow-Tit.

Suthora webbiana mantschurica, Taczanowski.

Suthora webbiana mandtschurica, Taczanowski, Bull. Soc. Zool., France, X, p. 476.

This beautiful little bird differs from any of the foregoing tits in having a short, deep, somewhat parrot-like bill. It is of a pale greyish-brown colour, often with a washing on the head, neck, and breast of a fine rose colour. It is a very small bird, smaller than any of the foregoing. It has a long tail, though the latter is not so long as that of the long-tailed tit.

It moves in troops of from ten to twenty individuals. I saw several troops in the I-mien-p'o district, but failed to secure specimens.

Mr. A. H. Clark, in reporting upon Louis Jouy's collection of birds from Corea,* states that there are three specimens of this subspecies in the collection as well as two of Campbell's *S. fulvicauda*, the true Corean form.

26. Penduline Tit.

Remizus pendulinus consobrinus, (Swinhoe).

Aegithalus consobrinus, Swinhoe, Proc. Zool. Soc. Lond., 1870, (Mar. 10), p. 133.

The penduline tit differs markedly in appearance from all the other forms hitherto described. It further differs in being migratory in its habits. It is not a very common species in these parts, though it appears to be more plentiful in the Yang-tzu region.

Mr. La Touche records one from Chin-wang Tao on May 13; while my collector secured four specimens together on March 19, 1914, and another on March 27 of the same year in Tientsin.

About 3½ inches in length, the male has the crown and nape a light grey; the mantle and wing coverts a rich chocolate-vinous-brown; the back and rump a lighter shade of the same; the flight feathers and tail dusky; the throat, chest and lower parts a light buffy-white; a black band occurs across the forehead enveloping the eye; the bill is small and pointed; the legs and feet large, and of a dull black colour.

*Proc. U. S. Nat. Mus., Vol. 38, pp. 147 and 148.

The bird frequents reeds and bushy ground. Where it breeds, or any particulars of its breeding habits I have been unable to ascertain.

Another species was described by Suschkin under the name *Remiza yenissiensis* from the Yennesei region of Siberia; but I think that the form occurring in Manchuria is certainly Swinhoe's *consobrinus*.

Family Crateropodidæ.

The babblers, or *Crateropodidæ*, which form so important and interesting a part of the avi-fauna of Eastern Asia, are represented in the Manchurian Region by but a single resident species, and that occurs only in the extreme south-west, where the North Chihli mountains extend into Fengtien. The babblers are an interesting group of short-winged ground-loving birds. They are lively in their habits, generally gregarious and sociable; while many are possessed of sweet voices.

27. David's Scimitar Babbler.

Pterorhinus davidi, Swinhoe.

Pterorhinus davidi, Swinhoe, Ibis, 1868, p. 61.

This is a dull plumaged bird of a dark olive-brown colour. There is a faint steel-blue wash on the outer edges of the primaries; the long, curved, scimitar-shaped bill is pale lemon yellow at the base, horn-brown at the apex; he eyes are pale yellow, the legs brownish; the wings are short and rounded; the tail long, broad, and wedge-shaped.

The birds of this species usually associate in flocks of six or seven, and might well be called the Chinese seven-sisters birds. They have sweet musical voices, their songs and calls being heard continually throughout the more open hilly districts, where they keep to the low bushes and shrubs. The nests, which are compact and much resemble that of the thrush, are built in dense thorn scrub in ravine bottom, at a height of from four to five feet from the ground.

As already stated this species occurs in the hills of the extreme south-west of Manchuria.

Family Sittidæ.

The *Sittidæ*, or nuthatches, are represented in Manchuria by at least two distinct forms. They are interesting little birds keeping almost exclusively to the forested regions, and living upon anything they can find from nuts, and seeds to fruit, and grubs of various kinds.

28. Amur Nuthatch.

Sitta europæa amurensis, Swinhoe.

Sitta amurensis, Swinhoe, Proc. Zool. Soc. Lond., 1871, p. 350.

The Amur nuthatch is one of the commonest birds of the Manchurian forest. All day long in autumn and winter it may be heard and seen, as it darts from tree to tree, and stump to stump in its tireless search for food. Insects are always acceptable, but its favourite diet consists of nuts of various kinds. These it cleverly jams into some cleft in the bark of a tree, and then splits open by vigorous, rapid blows. The force with which it drives these blows is incredible, and one would almost expect to see the little bird's bill shattered, instead of the hard shell of the nut. Hazel and pine nuts are its favourites, and to secure these it will enter the huts of the natives, even when the occupants are at home, and raid the bins where the nuts that were gattered in the forest are stored.

This nuthatch is a beautiful little bird. The head, neck, back, wings, and tail are a fine blue-grey; there is a well defined white streak over the eye; the breast is buff inclined to rufous; the belly and under tail-coverts a deep chestnut, slightly streaked with buffy-white.

It is partially migratory, though it does not move over a very great area. It retires to the mountainous areas to breed, returning to the forests of the low-lands in the autumn.

The species occurs also in North Chihli in forested areas.

29. Chinese Nuthatch.

Sitta villosa, Verreaux.

Sitta villosa, Verreaux, V. N. Arch. du Mus. I, p. 78, pl. 5, fig. 1, 1865.

The points in which this bird differs from the foregoing are its duller plumage, the absence of any well defined white streak over the eye, and in its considerably smaller size. The upper parts are much darker, the crown of the head being almost black; while

the rufous-brown under the tail is very much less conspicuous. The female is duller in plumage.

It occurs at least in Central Manchuria where it keeps to mountains and wooded areas. Sir Evan James records having taken it in Manchuria. I secured species in the Tung Ling forested area of North-eastern Chihli.

Family CERTHIIDÆ.

The creepers are represented in these parts by two species, the common tree-creeper (*Certhia familiaris*), and the wall-creeper (*Tichodroma muraria*), neither of which is at all common.

30. COMMON TREE-CREEPER.

Certhia familiaris familiaris, L.

Certhia familiaris, L., Syst. Nat. I, p. 184, 1766.

The common tree-creeper, so familiar to British bird lovers, occurs also in the Manchurian Region, and in neighbouring North China and Corea, though it cannot be claimed to be a common bird, except, perhaps, in the last named place, where Taczanowski recorded it. The same observer records it from the Ussuri.

This pretty little bird may be recognized by its brown, streaked upper parts, white under parts, rather long, slightly curved bill, and pointed tail feathers.

Hartert has described a subspecies, *C. familiaris japonica*, from Japan, another, *C. f. bianchii* from Kansu, West China, and a third *C. f. tianshanica* from the Thian Shan, West Mongolia.

31. WALL CREEPER.

Tichodroma muraria (L).

Certhia muraria, L. Syst. Nat. I. p. 184, 1766.

This beautiful bird occurs all over the mountainous and hilly areas of North China, whence its range extends into South-western Manchuria.

Of a slate-grey colour, it has the wings splashed with bright crimson: the primaries are marked with a series of large, round white spots, the tips of the outer tail feathers also being white; the bill is long, curved, and slender, and of a black colour, as also are the legs and feet, which are armed with long, curved claws. The wings being large, the flight of this bird is jerky and erratic. Though it sometimes proceeds rapidly in a straight line, it seems to prefer flitting about.

The wall creeper is comparatively common in North China, but not in the region on the Manchurian border. It is much more common in the west.

It frequents rocky cliffs, and is an expert climber, prying into cracks and crannies with its long bill for the insects upon which it lives.

Family Troglodytidæ.

At least three wrens occur in the Manchurian Region. These are the Chinese wren (*Nannus fumigatus*, T. & S.) occurring in the south-west, the Corean wren (*N. troglodites peninsulæ*, Clark) occurring, probably, in the south, and the Ussurian wren (*N. fumigatus ussuriensis*, But.) occurring in the forested regions of the north, and east. They are all closely related to one another, and very similar in appearance and habits.

32. Chinese Wren.

Nannus fumigatus, (T. & S.)

Troglodytes fumigatus, T. & S., Man. d'Orn. Vol. III, p. 161, 1835.

The Chinese wren, a little smoke-brown bird, lightly barred with black, occurs all over North China and in South-western Manchuria. It frequents mountain valleys and ravines, along the streams of which it seeks its food. In shape it closely resembles the common European species, but is much darker in colour.

33. Ussurian Wren.

Nannus fumigatus ussuriensis (Buturlin).

Anorthura fumigata ussurienses, Buturlin, Messager Orn. I, 1910, p. 118.

This subspecies of the Chinese wren occupies the basin of the Ussuri, whence it was originally described. It probably occurs elsewhere in the forested areas of Manchuria and the Amur, but is nowhere common. Whether this is in fact a distinct form it is impossible to say without specimens for comparison, but it seems doubtful from the fact that *amurensis* described from the Amur is referrable to Clark's *peninsulæ*

34. Corean Wren.

Nannus troglodytes peninsulæ, (Clark).

Olbiorchilus fumatus peninsulæ, Clark, Proc. N. S. Nat. Mus., Vol. 32, 1907, p. 474.

This species, which is scarcely distinguishable from the foregoing, probably occurs in South Manchuria, indeed Hartert gives Clark's *O. f. amurensis* described at the same time as *peninsulæ* as a synonym. He says it is not so dark as *fumigatus*, though it has the upper parts darker than in *dauricus* from Transbaicalia. The throat and upper breast or chest are plain the wing-coverts with small roundish triangular white spots.

Family Cinclidæ.

Next to the wrens come the dippers, which in many ways are just very large wrens. They occupy mountain valleys and ravines, and build nests very much like those of the wrens. The Manchurian Region is occupied by but one species, *Cinclus pallasi*, the same that occurs throughout North and Central China.

35. Pallas' Dipper.

Cinclus pallasi pallasi, Temminck.

Cinclus pallasi, Temminck, Man. d'Orn. Vol. III, p. 107, 1835.

Pallas' dipper differs from the European and British bird in being of a uniformly very dark olive-brown, faintly barred with a lighter buffy colour in the immature, there being no white on the body at all. It has long legs and big feet, and a short little tail, which it holds upright just as does the wren. It frequents rocky mountain valleys, which there are permanent, clear streams, and in places where these remain unfrozen, or only partially frozen through the winter, the dipper stays the year round.

This bird has been recorded by Schrenck from the Amur, by Buturlin from the Ussuri, and by Taczanowski from Corea.

I have frequently watched dippers disporting themselves in the mountain streams of Shensi, where they are particularly common. They will dive into the swift current, and appear to be able to swim on the surface with ease, or to dive underneath, apparently in search of food, remaining under for quite lengthy periods. They are excessively lively, and utter a peculiar resonant cry, something like that made by knocking two stones together.

Family Sylviidæ.

Of the whole family of warblers, *Sylviidæ*, there appears to be but one species that can be claimed as a permanent resident of the Manchurian Region, and that one belongs to a genus, in many ways very distinct from the rest of the genera of the family. Indeed in some respects it seems to be more closely related to the *Crateropodidæ*. The genus and species referred to is Swinhoe's *Rhopophilus pekinensis*. It really belongs to North China, and only occurs in the extreme South-west of Manchuria.

36. North China Hill-Warbler.

Rhopophilus pekinensis, (Swinhoe).

Dryomœca pekinensis, Swinhoe, Proc. Zool. Soc. Lond., 1870, pp. 436 & 443, and 1871, p. 352.

This beautiful little bird, as already stated, belongs to North China, where it occurs in the open mountainous country. Thence it ranges into South-western Manchuria.

The head, back, wings, and tail are of a greyish-brown, the back being streaked with black; the throat, breast belly and flanks are white, the flanks streaked with chestnut; the wings are short, and rounded, the tail long and slightly wedge-shaped; the bill is longish and slightly curved, of a pale brown colour, as also are the legs and feet.

In habits this little bird much resembles David's scimitar babbler, frequenting the same spots, and keeping to the low brush in the same manner. It is not so gregarious, and is seldom seen more than two together. It builds its nest usually in the low upright stems of the wild rose, or other short shrubs that grow on the open hill-sides. It is non-migratory, even to a limited extent.

Family Prunellidæ, or Accentoridæ.

The accentors, to which belongs the familiar little hedge-sparrow of the English country-side, are represented in the avifauna of our region by but two species, one of which is migratory; the other not. These are the Chinese alpine accentor (*Prunella collaris erythropygius*, Sw.) and the Chinese hedge-sparrow (*P. montanella*, Pall.), both of which are mountain inhabiting species, though the latter is to be met with during the migrations upon the flat-lands and plains in great numbers.

37. Chinese Alpine Accentor.

Prunella collaris erythropygius (Swinhoe).

Accentor erythropygius, Swinhoe, Proc. Zool. Soc. Lond., 1870, (Feb. 24), p. 124 & 125, pl. IX.

This beautiful bird remains in Manchuria all through the winter, frequenting the highest mountain, and hill tops. It is essentially a bird of rocky screes, where amongst the tumbled boulders it finds sustenance in the crevice-inhabiting insects, but more especially in the wild berries that occur.

In Manchuria I came across it on certain high, rocky peaks in the forests to the north of I-mien-p'o, but having only my rifle with me, could not secure specimens. From what I could see of them the birds of this region were the same as those from China.

The head, and breast are grey; the gorget white, spotted in regular rows with black; the back and wings are brown, streaked with black; the rump, under-tail coverts and flanks are a rich rufous; the tail feathers are black edged with rufous-brown. In size this bird is between a sparrow and a starling.

James records it from Manchuria under the generic name of *Accentor*.

Family Fringillidæ.

The *Fringillidæ*, or finches, to which belong a large number of species including the gros-beaks, bullfinches, cross-bills, siskins, linnets, buntings, and many others, are an interesting family of passerines, characterized by their strong, thick bills, and gramnivorous habits. They are nearly all both migratory and residential, belonging to the class that migrates over a certain more or less limited area, though some of them, such as the yellow-breasted bunting (*Emberiza aureola*, Pall.), are migratory in the truest sense. On this account I am splitting the family up, dealing with non-migratory and partially migratory species here, and the entirely migratory species under the migrant birds. Another species that is purely migratory and should be mentioned is the migratory gros-beak (*Eophona melanura migratoria*, Hartert.) It, too, will be described with the migrants.

The finches are well represented in the Manchurian Region, where conditions are such that they find a good and easy living.

38. Large-billed Gros-beak.

Eophona personata magnirostra, Hartert.

Eophona personata magnirostra, Hartert, Bull. Brit. Orn. Club, V. 1896, p. XXXVIII.

This handsome bird, which, but for the bright yellow of its bill, and its large size, would remind one of a hen bullfinch, occurs in Manchuria as well as in North China and Corea the year round, though apparently occupying different parts in different seasons. In summer it retires to the higher, forested mountains to breed, returning to the wooded foothills and plains in the winter.

The crown, back of the head, chin and throat are a shiny blue-black, as also are the wings and tail; a white band occurs across the primaries, about half way down their length; the rest of the plumage, including the cheeks, is an ashy-grey, slightly darker above than below; the enormous bill is yellow; the legs are brown.

The Chinese of mountainous regions have told me that this bird nests in large deciduous trees; but I have never come across one of its nests.

Its food consists of all kinds of seeds, and even pine nuts, which it has no difficulty in cracking with its thick and powerful bill.

The species, by reason of its intelligence, and powers of learning simple tricks, is a great favourite amongst Chinese bird fanciers, by whom it is known as *La-ts'uei*, or wax-bill.

39. Eastern Hawfinch.

Coccothraustes coccothraustes japonica, T. & S.

Coccothraustes vulgaris japonicus, T. & S., Faun. Jap., Aves, p. 90. pl. 51, 1850.

The eastern hawfinch so closely resembles the well known hawfinch of Europe and Great Britain, as scarcely to need description. It appears to be a little more than partially migratory in its habits, large numbers, especially immature birds, leaving the Manchurian Region for East China, Corea and Japan for the winter.

While in the forests of North Kirin, I noticed large flocks of these birds moving south in September, and all the specimens I secured were immature. On the other hand I saw fully adult

specimens in the same regions after the first snows had fallen; and in North China in the middle of winter, when the ground was frozen hard, and the thermometer stood at a few degrees from zero, I have secured specimens of fully adult birds, both in forested mountainous areas and on the bleak, wind-swept plains.

The chief point in which the eastern form differs from the western species is in its plumage being lighter or greyer, the quills of the wing being grey on their outer web.

The head is greyish-brown; the mantle grey, merging into brown on the scapulars and back; the greater wing coverts are white; the quills blue-black, with grey outer web, white on the inner web near the base; the tail has the middle feathers brown, the next black, tipped with white; the breast and flanks are a light brownish-grey; the throat black; a narrow black band encircles the base of the bill and eyes; the bill is heavy, thick, and of a horny colour; the legs stout and short, and pinkish in colour; the tail short, and the whole body thick-set and heavy in appearance.

The members of this species nest in wooded and forested mountainous areas.

40. Manchurian Green Finch.

Chloris sinica ussuriensis, Hartert.

Chloris sinica ussuriensis, Hartert, Vögel paläarkt. Fauna, I, 1903, p. 64.

Though the Chinese greenfinch (*Chloris sinica*) probably occurs in South-western Manchuria, the form that occupies the other parts represents Hartert's subspecies *C. s. ussuriensis*, which it nevertheless closely resembles.

The head, neck, and back are grey with a greenish tinge; the breast is buff-grey washed with bright yellow, which rather increases on the sides: the wings are heavily marked with brilliant golden yellow on the quills; as also are the basal halves of the retrices, or tail feathers; the bill is stout and horn coloured, as also are the feet; size about that of the sparrow, but the tail is shorter.

The bird is usually seen in small flocks, keeping to the more wooded mountainous or hilly areas.

Its range extends into Corea, where it is a resident species, specimens being taken by Jouy in June, on the 10th, 12th and 25th, and also in October, as late as the 27th.

Ingram records *C. sinica* as breeding in the Khingan Mountains; but states that he is unable to tell if his birds belonged to Hartert's subspecies, *ussuriensis* or not. This form differs from *sinica* in having a narrow, more slender bill, slightly longer wings, and lighter plumage.

41. Siskin.

Spinus spinus, (L.)

Fringilla spinus, L., Syst. Nat., I, 1766, p. 322.

This charming little bird is apparently the same in Manchuria as in China, as well as Europe.

It may be recognized by its green colour, the top of the head being black, and the wings being marked with yellow.

It is smaller than the greenfinch, and has a sharp, pointed, and rather narrow bill.

I have seen and taken specimens in many parts of China, as well as in Manchuria, and, apparently, it is one of those birds that are both residential and migratory.

The Chinese are very fond of it as a cage bird.

42. Short-billed Twite.

Acanthus flavirostris brevirostris, (Gould).

Linota brevirostris, Gould, Bp., Comp. List, p. 34, 1838.

Linota brevirostris, Moore, Proc. Zool. Soc. Lond., 1855, p. 217.

This is a pale eastern form of the European twite (*Acanthus flavirostris*, L.), from which it further differs in its shorter bill. The twites may be distinguished from the redpolls by the absence of red on the crown, less rose colour on the other parts, and the brown, instead white washed with pink, upper breast. The head, throat, upper breast, flanks and mantle are brown speckled and streaked with blackish; the outer retrices are edged with white; the lower breast, belly and under tail covert are white; the bill is yellow; the legs brown.

43. Mealy Redpoll.

Acanthus linaria linaria, (L.)

Fringilla linaria, L., Syst. Nat. I, 1766, p. 322.

The common redpoll of North China and the Manchurian Region is the mealy redpoll (*Acanthus linaria linaria*, L.) whose range extends right across Asia into these parts.

It is light brown above, with dark centres to the feathers; dark crimson on the crown; while the throat and breast are washed with rose.

Ingram records *Linota linaria* from the Khingan Mountains, and Captain Karpow secured a specimen at Ying-tzu (New-chwang) in South Manchuria at the mouth of the Liao River.

44. Hoary Redpoll.

Acanthus hornemannii exilipes, (Coues).

Aegiothus exilipes, Coues, Proc. Acad. Nat. Sci. Phila., 1861, p. 385.

This redpoll, which occurs in these parts, differs from *linaria* in having no spots on the rump, white, unstreaked tail coverts, few and narrow streaks on the flanks, and very pale 'blush-red' breast and rump, instead of the vivid rose wash. It also has a very broad white edging to the tertials and tail feathers, very much lighter upper parts, and a smaller shorter bill.

45. Ussurian Long-tailed Rose Finch.

Uragus sibiricus ussuriensis, Buturlin.

Uragus sibiricus ussuriensis, Buturlin, Mess. Orn., VI, 1915, p. 128.

In my recent paper "On a new Rose-Finch from Siberia" published in the Bulletin of the British Ornithologists' Club, (No. CCXLVIII, Vol. XL, p. 98-102, 1920) I have pointed out the range and distribution of the known forms of the genus *Uragus*, by which it will be seen that Buturlin's subspecies *U. sibiricus ussuriensis* is a perfectly good form, and occupies the Amur basin, and those of its tributaries, the Sungari and Ussuri, as well as, probably, Corea and neighbouring North-east China; while true *sibiricus* belongs to the Altai and Thian Shan regions, my new form *fumigatus* to Middle Siberia, from the Krasnoyarsk region eastward to the Amur divide, and *sanguinolentus* to the Japanese Islands and Saghalin. Of these *fumigatus* is at once distinguishable from the others by its peculiar dark, smoky appearance, true *sibiricus* by its light plumage, in which there is a considerable amount of white, as well as much of the beautiful rose pink, *sanguinolentus* by its much darker, browner plumage, with much less white and a far more intense rose or crimson colour, as well

as its much smaller size, and *ussuriensis* by being intermediate, both in colour and size, between *sibiricus* and *sanguinolentus*. The forms *fumigatus*, *ussuriensis*, and *sanguinolentus* may all be considered as subspecies of true *sibiricus*.

These rose finches differ from the other so-called rose finches (*Carpodacus erythrinus grebnitskii*, and *Carpodacus roseus*) of these areas in being smaller in the body, with proportionately much longer tails, smaller, shorter bills, in having the parts of the plumage not white or washed with rose of a more greyish, less brown colour, and in having the two outer pairs of retrices white, the next dusky black and white.

In our present form the forehead and face are of a rich crimson, the crown is of a pale shiny pink, the feathers, which are large and pointed, being tipped white. The mantle is greyish-brown streaked with black, and washed with crimson pink or rose; the rump is rose. The feathers of the wing-coverts have a certain amount of white on them, but not so much as in true *sibiricus* or *fumigatus*; the secondaries are finely edged with white, the primaries even less so; tail as already indicated. The throat and cheeks much as the top of the head, with the same pointed feathers; chest, breast, and belly light brownish grey, washed with a considerable amount of rose. Bill short, and thick. Buturlin descibes it thus:

"*Uragus sibiricus ussuriensis* n. subsp. is coloured like *U. s. sanguinolentus* (T. et Schl.), but is larger: wing about 65-71 mm. (as against 61-68) and tail usually 73-78, exceptionally 71-82 mm. (as against 65-70)." These measurements agree with those of a series of birds in the British Museum collection.

These rose finches are forest inhabiting, moving about in troops of from half a dozen to a dozen members, in which, as well as in their actions, they resemble to a considerable extent the long-tailed tits. A specimen secured by me in the I-mien-p'o district has been referred wrongly to *sibiricus*.

46. Japanese Long-tailed Rose Finch.

Uragus sibiricus sanguinolentus (T. & S.)

Phyrrhula sanguinolenta, T. & S. Fauna Japonica, Aves, p. 92, pl. 54 et 54 b, 1850.

This very distinct subspecies appears to be a purely island form, occupying the Japanese Islands and Saghalin. It seems to have been confused with the bright coloured eastern mainland

form just described. Taczanowski's record of it in Corea, might possibly be correct, but even it is doubtful, while David's record of it from Peking is certainly incorrect.

A series of this subspecies in the British Museum collection shows the small wing, short tail and smaller size noticed by Buturlin very plainly. These birds were from Japan, Yezo and Saghalin. Those from the last named place show a very much more intense crimson than the mainland birds, though an intensification of the crimson, and the suppression of white on the wings is noticeable in all the island birds. Otherwise our subspecies is like *ussuriensis*, the neighbouring mainland form.

47. Pallas' Rose Finch.

Carpodacus roseus (Pallas).

Fringilla roseus, Pallas, Reis Russ. Reichs., III, p. 699, 1776.

This beautiful finch is common throughout the mountains of North China, and Siberia, including the Manchurian Region.

It may at once be distinguished by its beautiful rose pink plumage, its larger size than either of the foregoing, larger bill and shorter tail. The feathers of the head show the same pointed shape, and are shiny as well. In fully adult males the pink covers the whole of the plumage, in younger specimens only the head, back and breast. In the females it is entirely wanting.

This bird has been recorded by Taczanowski from Corea.

48. Grebnitski's Rose Finch

Carpodacus erythrinus grebnitskii, Stejneger.

Carpodacus erythrina grebnitskii, Stejneger, Orn. Expl. Command. Is. and Kamschat., p. 265, 1885.

Though of about the same size and build as the foregoing, this bird is at once distinguishable by its crimson instead of rose-pink colour; while the feathers of the head are of normal shape and appearance.

The plumage may be described as uniformly brown, suffused with crimson of greater or less intensity in the males, and with yellow in the females. The older the specimen the richer and more dominant the crimson or yellow. The bill is more hooked than in *C. roseus*.

This bird has a great range, extending from Kamschatka to Western Kansu, and southward up to and beyond the Yang-tzu. Mr. Austin H. Clark, in his report upon the birds seen and taken during the voyage of the United States Fisheries steamer "Albatross" in 1906, states that this species was extremely plentiful near Petropaulski in Kamschatka.

While on the Yalu I saw a couple of birds which I took to belong to this species.

49. Mongolian Desert Finch.

Erythrospiza mongolica, (Swinhoe.)

Carpodacus mongolicus, Swinhoe, Proc. Zool. Soc. Lond., 1870, June 9, p. 447 .

This is a little brownish bird, with a thick bill, and wash of red on the plumage. It is an inhabitant of Mongolia and neighbouring more or less desert regions, and as such probably occurs along the western border of Manchuria, though so far it has not been recorded.

50. Grey-bellied Bullfinch.

Pyrrhula pyrrhula griseiventris, Lafresnaye.

Pyrrhula griseiventris, Lafresnaye, Rev. et Mag. de Zool., p. 241, 1841.

The bullfinches of the Manchurian Region are rather a puzzling group; but it would appear certain that the form which occurs in the south, central and western parts of that region is *Pyrrhula p. griseiventris*, which is at once distinguishable from the European bird by its grey, instead of rose-coloured, breast.

It has been taken in Corea at Fusan by Louis Jouy, and also occurs in North-eastern China.

Seebohm in a paper in the *Ibis*, (Jan. 1887) gives two forms as inhabiting the Amur basin, namely *P. rosacea* and *P. major*, and three from the Ussuri basin, *P. cineracea pallida*, *P. vulgaris kamtschatica*, and *P. orientalis rosacea*.

In addition to these Sharpe has described *P. kurilensis* from the Kuril Islands, and Cabanis another species *P. cineracea* from the Baikal region.

Under the circumstances it is almost impossible to determine the exact status of all these names, and how many of the forms they represent actually occur in our region. It seems evident, however, that at least one rose-breasted, and one grey-breasted form occur on the mainland, with a distinct form in the Kuril Islands.

Hartert in his "Palœarctic Fauna" gives Taczanowski's *P. p. kamtschatica* as inhabiting the Ussuri and Kamschatka, and *P. p. griseiventris* as occupying Manchuria and the Lower Amur. He describes this bird as being as large as *P. p. europea*, and having the side of the head and chin band a pretty rose, the rest of the lower parts either pure grey or else more or less strongly washed with rose, the back also frequently having rose edges to the feathers, all intermediate variations occurring, and due, apparently, to age. The light tips to the greater wing-coverts are narrower than in *europea*. The female is like that of *europea*, but lighter below, with the sides of the head and chin lighter and more reddish.

51. Kamschatkan Bullfinch.

Pyrrhula pyrrhula kamtschatica, Taczanowski.

Pyrrhula kamtschatica, Taczanowski, Bull. Soc. Zool. France, 1882, p. 395.

This bird, which is said by Hartert to occur in the Ussuri Valley, is described by him as being extremely like *P. p. pyrrhula*, but perhaps rather larger, lighter on the back, with the tips of the greater wing-coverts pure white, and with a white shaft streak alway present in the retrices. The wing in the male measures 94 to 96 mm.

52. Kuril Islands Bullfinch.

Pyrrhula pyrrhula kurilensis, Sharpe.

Pyrrhula kurilensis, Sharpe, Zoologist, 1886, p. 485.

This species according to Hartert is hardly to be distinguished from *P. p. griseiventris*. It is lighter grey above and below, either pure grey below or with a dash of rose.

53. Kamschatkan Pine Grosbeak.

Pinicola enucleator kamtschatkensis (Dybowski)

Corythus enucleator kamtschatkensis, Dybowski, Bull. Soc. Zool. France, VIII, 1883, p. 367.

The pine grosbeak is one of the largest of the finches inhabiting these parts. It is a handsome bird related on the one hand to the bullfinches and on the other to the crossbills.

The plumage is brown heavily washed in the males with crimson, in the females with yellow, with a certain amount of white on the wings. The bill is strong and inclined to be curved, but it is not so large as in the hawfinch or large-billed grosbeak, already described. The bird also has somewhat the appearance of the rose finches, but is, of course, much larger. It has rather a long tail. The eastern form *kamtschatkensis*, which is probably that which occurs in the Manchurian Region, has the colours purer and richer than the more westerly Siberian form *Pinicola enucleator*, of which it is a subspecies.

Our form keeps entirely to the forested areas, where it builds its nest in spruce or fir trees, not very high up. With its powerful bill it is able, like the crossbill, to extract the seeds from the cones of pines and other conifers.

54. White-bellied Crossbill.

Loxia curvirostris albiventris, Swinhoe.

Loxia curvirostris albiventris, Swinhoe, Proc. Zool. Soc. Lond., 1870 (June 9.) p. 437.

There are two forms of crossbill occurring in the Manchurian Region. The present species is distinguishable from the common European form by its white belly and under tail-coverts. The male when in full plumage is of a deep crimson colour, the female brown washed with olive yellow. There is no white on the wing.

These birds are forest inhabiting, living almost entirely upon the seeds of pines and other conifers, which they easily obtain by picking the hard bracts of the cones to pieces with their powerful, sharp, hooked bills.

This species is very common in the mountainous and wooded areas of North China.

55. Elegant White-barred Crossbill.

Loxia bifasciata elegans, Homeyer.

Loxia elegans, Homeyer, Journ. f. Orn. 1879, p. 180.

The present form differs from the foregoing in having two white bars on the wing, and from the western form, *Loxia bifasciata*, in being more intensely and definitely coloured.

It is of a crimson-red colour with black wings, barred white. In shape and size it is about like the foregoing. Poljakov recorded this form from the Ussuri.

56. Brambling.

Fringilla montifringilla, L.

Fringilla montifringilla, L., Syst. Nat., I, p. 318, 1766.

The brambling appears to be the same from Europe to the East Asiatic Coast. It is one of the commonest finches in Manchuria. It keeps largely to the mountainous areas. Partially migratory it may be seen traversing the country from north to south in large numbers, though many remain behind throughout the winter.

It breeds in the mountainous areas.

With its rich chestnut-buff plumage, mottled on the head and back with shiny blue-black, white barred wings, white rump and long black tail widely forked at the end, this bird is easily recognized. The female is greyer of plumage, without any of the blue-black mottlings that characterize the male, and increase with age till the head is entirely covered. In size it somewhat exceeds the common sparrow.

The Chinese are very fond of the brambling as a trick bird, and large numbers are trapped during the migrations.

I saw it in the Kirin forest and on the Yalu; while Ingram records it from the Khingan Mountains.

57. Short-billed Rock Sparrow.

Petronia petronia brevirostris, Taczanowski.

Petronia brevirostris, Taczanowski, Journ. J. Orn. France. 1874, p. 323.

This bird was recorded and described by Taczanowski from Ussuri, where it occurs in rocky cliffs. It probably also occurs in other parts of Manchuria.

It closely resembles the western from, *Petronia p. petronia*, but as its name indicates has a shorter bill.

The male has the crown brown with a light, rather broad, whitish eyebrow; the cheeks pale ashy brown; the upper parts are brown, streaked on the mantle with black, the wings being dusky with white tips to the upper and greater coverts; the throat and under parts are light ashy-brown with a yellowish patch on the lower throat.

58. House Sparrow.

Passer domesticus (L.)

Fringilla domestica, L., Syst. Nat., ed. 10, I, 1758, p. 183.

It is extremely doubtful if this bird occurs in the Manchurian Region, its place probably being taken by the tree sparrow, which is the common sparrow of this and neighbouring parts of Eastern Asia. Nevertheless it is given in the list of Manchurian birds supplied me by Dr. Richmond and Mr. Riley, and so I include it here. There is no need to describe so common and well-known a bird.

59. Tree Sparrow.

Passer montanus montanus, Brisson.

Passer montanus, Brisson, Ornith., III, No. 2, p. 79, 1760.

The sparrows that I secured in Manchuria (Lower Sungari) have been referred to this species; which being the same as the European form needs no description here. It may readily be distinguished from the house sparrow by its more definite markings, in which the female agrees with the male.

Two forms of snowfinch may here be mentioned. These are *Montifringilla gigliolii* (Salvad.) which is said to occur in Dauria in winter, and *M. brunneinucha*, Brandt, which Hartert gives as occupying Kamschatka, the Kuril Islands, North Japan, East Siberia, and the mountains of North China. There do not appear to be any Manchurian records.

Sub-family Emberizinæ.

The buntings, which form a sub-family, *Emberizinæ*, of the *Fringillidæ*, are divided into two groups; those that are purely migratory, and those that are either non-migratory, or only partially so. We have to deal here only with the latter group, which contain the following species: Pallas' reed bunting (*Emberiza pallasi*), the rustic bunting (*E. rustica*), and the Lapland bunting (*Calcarius lapponicus*), which winter in the southern part of the Manchurian Region, and breed in the extreme north, the chestnut-headed bunting (*E. cioides castaniceps*), and Jankowski's meadow bunting (*E. jankowskii*), which are practically non-migratory, and the snow bunting (*Plectrophenax nivalis nivalis*), which is a winter visitor only, but is included here for reasons already stated.

60. Pallas' Reed-Bunting.

Emberiza pallasi (Cabanis).

Cynchramus pallasi, Cabanis et Hein., Mus. Hein. I, p. 130, 1850.

The reed-bunting that frequents these parts throughout the year is known as *Emberiza pallasi*. At least two other reed-buntings occur, but they are migratory. The present species is smaller than the other two, and is the smallest but one of the buntings that frequent these parts. The smallest is *E. pusilla*.

It has the head and gorget black, lightly barred with buff in winter; the sides of the neck, lower breast, and belly are greyish or dirty white; the nape grey-buff; the back buff-brown, streaked with black in summer and with black and white in winter; the flanks are streaked with dusky; wings and tail as in other buntings, but with more black.

Ingram records this bird in the Khinghan Mountains during the breeding season; while I secured specimens in Tientsin, Chihli, in March and also in November and December, occurring in the long grass and reeds all through the winter. La Touche records it at Chin-wang-tao on February 23rd.

61. Rustic Bunting.

Emberiza rustica, Pallas.

Emberiza rustica, Pallas, Itin. Vol. III, App. No. 21, also Reis. Russ. Reichs, III, p. 698, 1776.

This is perhaps the commonest of all the buntings in the Manchurian and neighbouring regions. It occurs chiefly on open plains, but may be found in the larger marshy clearings in the forested areas. It occurs in the open country throughout the winter.

The crown, cheeks and ear-coverts are black; throat and eyebrows are white, the former with black mustache streaks; the nape and wing-coverts are well suffused with deep chestnut, a slight band of the same colour forming a gorget round the chest; the lower back is grey-buff spotted with chestnut; the wings are light chestnut with conspicuous black spots on the secondaries, otherwise resembling those of other buntings; the breast and lower parts white, streaked with chestnut on the flanks; tail long, brown, with outer retrices white.

I secured specimens of this bird in the forest area in North Kirin during the autumn migrations; and in Tientsin during the winter. Bianchi records it on May 2nd, 1901, at Ying-kou, or Ying-tzu (Newchwang), at the mouth of the Liao River in South Manchuria.

62. Chestnut-headed Bunting.

Emberiza cioides castaneiceps, Moore.

Emberiza cioides castaneiceps Moore, ex. Gould, Proc. Zool. Soc., Lond., 1855, p. 215.

This bunting is essentially a hill-inhabiting species. I secured specimens in the hills along the Yalu River in South Manchuria, where it probably occurs throughout the winter, as it certainly does in the hills and mountains of North China.

It is a handsome bird, having the crown, nape, sides of the head, and the upper breast and chest of a rich chestnut-chocolate colour; the eyebrows are white, a black patch occurring in front of the eye, below which a white band occurs sloping downward, and then a black one; the gorget is of a fine light grey, the back, wings, and tail are of a chestnut brown colour; the lower breast and belly buff with a chestnut tinge; the outer tail feathers are white with chestnut outer webs, the next pair half white, the rest brownish with chestnut edges.

James secured specimens at Hun-chun in South Manchuria on Nov. 6th 1886.

63. Jankowski's Bunting.

Emberiza jankowskii, Taczanowski.

Emberiza jankowskii, Taczanowski, Ibis. July, 1888, pp. 317-319, pl. VIII.

Described by Taczanowski as long ago as 1888, this bird occupies the Corean and Manchurian border. I did not, however, encounter it on my trip up the Yalu.

From the description and plate it is very like the foregoing species, but is distinctly paler, with less chestnut on the upper parts, and without any chestnut on the breast, the chest and breast being greyish with a dark patch on the lower chest; the throat is white.

64. Godlewski's Bunting.

Emberiza godlewskii, Taczanowski.

Emberiza godlewskii, Taczanowski, Journ. f. Orn., 1874, p. 330.

Somewhat like the meadow bunting (*E. cioides*), this bird has a more chestnut breast, the grey of the throat coming down on to the chest; grey eyebrows and cheeks, instead of white. There is also grey on the crown and nape, while the black streaks on the upper back are more pronounced.

65. Snow Bunting.

Plectrophenax nivalis nivalis (L.)

Emberiza nivalis., Syst. Nat. I, p. 308, 1766 and Ed. X, p. 176, 1758.

The snow bunting is a winter visitor to Manchuria. It breeds in Siberia, the Aleutian Islands, and Alaska, where it keeps to the snow covered parts as much as possible.

It may be recognized by its white head, nape, breast, belly and wings, and its dark, grey-black back, wing-coverts and tail, the outer feathers of the latter being white.

Clark records of the snow bunting (*E. n. townsendi*, Ridgway) that he found a nest with four eggs in "a recess under a large boulder, about a foot from the opening, which was almost completely hidden by a large tuft of grass," and situated on the beach, not much above high water mark.

The snow bunting occurs in winter as far south as North-eastern Chihli, where La Touche states one of these birds was shot at Chin-wang Tao.

66. Lapland Bunting.

Calcarius lapponicus lapponicus (L.)

Fringilla lapponica, L., Syst. Nat. I, p. 317, 1766.

Ingham records the Lapland bunting as occurring in the Khinghan Mountains during the breeding season, which makes it a permanent resident species in the Manchurian Region, for it occurs there in winter as well. It is possible that the subspecies *C. lapponicus coloratus*, Ridgway also occurs in Manchuria, but this has not been established as yet.

In the records of the Russian Arctic Expedition (1900-1903) published in the *Ibis* (1908, p. 593), Dresser states on the authority of Dr. Walter and Mr. Birula that the Lapland bunting breeds commonly in Taimyr and the New Siberian Archipelago.

This bird occurs as far south as North-eastern Chihli in winter, which place it doubtless reaches from Siberia *via* Manchuria.

It may be recognized in summer by its black head, throat and upper breast, white lower breast and belly, rich chestnut nape, and brown, speckled or streaked upper parts, wings and tail, and also by its long hind claw, which at once distinguishes it from all other buntings. In winter the head and nape assume a light speckled appearance, caused by the ends of the feathers becoming white or buff.

I have secured many specimens in the vicinity of Tientsin during winter months.

Family AMPELIDÆ, or BOMBYCILLIDÆ.

The waxwings, of which two forms occur in these parts, are partially migratory. Large flocks may be seen in North China and Western Manchuria in the coldest weather. They appear to belong to the group of birds that retire to mountainous or northern areas in the summer, returning to lower levels or latitudes in winter, some migrating in the truest sense, others only doing so within a proscribed area.

67. BOHEMIAN WAXWING.

Bombycilla garrulus*, (L.)

Ampelis garrulus, L., Syst. Nat., I, p. 297, 1766.

This striking bird occurring alike in Europe and Asia is almost too well known to need description. Its long crest, fine dove-grey brownish colour, washed on the head and breast with chestnut, its black flight and tail feathers, tipped on the primaries and retrices with bright yellow, and on the secondaries with white, to which hang the little waxy looking red appendages that give the bird its name, its black eye band and throat, and chestnut under tail-coverts, make it a most elegant bird. The bill and feet are black, the gape wide.

* *Bombycilla* is the name used by Brisson, (Ornith. II, p. 333) in 1760, thus taking precedence of Linnæus' *Ampelis*, 1766.

It lives almost exclusively during the winter on berries, one of its favourite foods being mistletoe berries. It has a long, shrill note, which it utters at frequent intervals as it flies from tree to tree in search of its food.

Buturlin has described a subspecies *B. garrulus centralasiæ*, but I am satisfied that true *garrulus* occupies Manchuria.

68. Japanese Waxwing.

Bombycilla japonica, (Siebold).

Bombycivora japonica, Siebold, Hist. Nat. Jap.-St., No. 2, 1824.

The Japanese waxwing, which occurs in Manchuria as well as North China, is a somewhat smaller bird than the foregoing, and is greyer in its general colour. The tips of the wing and tail quills are a fine crimson or carmine instead of yellow; while there are no waxy appendages. There is a rich crimson carmine patch on the greater wing-coverts, the upper coverts being ashy grey.

This species appears to be more migratory than *B. garrulus*.

Family Alaudidæ.

The larks are represented in the Manchurian Region by some nine species and subspecies, all of which are to be found in the country in both winter and summer, though many are at least partially migratory.

They are for the most part inhabitants of the open plains, though some occur in hilly and mountainous country as well.

69. Mongolian Lark.

Melancorypha mongolica, Pallas.

Alauda mongolica, Pallas, Zoogr., I, p. 516, pl. 33, fig. 1, 1811-31.

This, the largest and handsomest member of the lark family that inhabits these parts, occurs in the western part of Manchuria during the warmer months, and in the south as well during the winter. It really belongs to the Mongolian Avi-faunal Subregion, but extends into Manchuria as indicated.

The crown and back of the head are of a rich chestnut brown, with a lighter patch in the middle of the crown, and a lighten band at the back of the head; the cheeks are pale buff; the throat white, the white extending round the neck and merging into the light buff-brown of the nape; a broad band of black occurs on the breast, being partially divided in the middle, and ending half way round the shoulders; the breast is buffy-white; the back light brown with darker, more chestnut-brown markings; the secondaries are white; the primaries black; the central tail feathers and upper tail-coverts are of a rich chestnut colour, the other tail feathers being black with white outer webs on the outermost pair; bill and legs horn coloured, the former being stout and strong.

The Chinese call this bird *Pai-ling-tzu*, of hundred tongues, and prize it very highly as a songster. Indeed, it ranks foremost of all the Chinese song-birds, for not only has it a great *repertoire* of its own, but it readily imitates the songs of other birds with great accuracy. It also imitates the mew of a cat and other sounds it hears about its cage, even to the peculiar quavering cry of the kites that haunt most large towns in North China as scavengers. It is the shop-keeper's or merchant's bird and bespeaks eminent respectability for its owner, just as the Chinese laughing thrush, or *Hua-mi*, as it is called, is the bird sported by ne'er-do-wells and men of loose morals, and extravagant dress.

70. Manchurian Crested Lark.

Galerita cristata lautungensis, Swinhoe.

Galerita cristata lautungensis, Swinhoe, Ibis, 1861, pp. 256-257.

This is the typical crested lark of Manchuria and China. It is like the European form, and is easily distinguishable from all the other larks by its size and long crest.

It is of a dull sandy brown colour above, rust brown on the wings and rump, light below with a darker, spotted chest; the crown and crest are streaked with black. It frequents the dry and sandy parts of the country.

Swinhoe described it from the Liao-tung Peninsula in 1861.

71. Eastern Skylark.

Alauda arvensis pekinensis, Swinhoe.

Alauda arvensis pekinensis, Swinhoe, Proc. Zool. Soc., Lond., 1863, p. 89.

Three skylarks have been described as from East China, namely, *Alauda arvensis pekinensis*, *A. a. intermedia*,* and *A. a. cinerea*, of which the first and the last are probably the forms that occur in Manchuria, *A. a. intermedia* apparently occupying the region about the Yang-tzu, though recorded by Paljakov from the Ussuri region.

A. a. pekinensis is a very much darker form than the European bird, *A. arvensis*, being well marked with black. Bianchi records it from Ying-tzu, South Manchuria; while La Touche has secured specimens at Chin-wang Tao, and myself in the Tientsin district.

72. Ehmcke's Skylark.

Alauda arvensis cinerea, Ehmcke.

Alauda cinerea, Ehmcke, Journ. f. Orn., 1903, p. 149.

Ehmcke's skylark (*A. a. cinerea*) approaches the light race *A. a. cantarella* Bp. of South-eastern Europe; but is somewhat greyer, and slightly smaller. Hartert retains the subspecies in his "Vögel der Paläarktischen Fauna." The race ranges from Eastern Siberia throughout that country, where it breeds, as far as Egypt, and into China during the winter.

Ingram records it in the Khingan Mountains, where it probably breeds.

It is lighter and greyer than the foregoing subspecies.

73. North China Sand Lark.

Calandrella minor cheleensis, (Swinhoe).

Alaudula cheleensis, Swinhoe, Proc. Zool. Soc. Lond., 1871, p. 390.

This little lark is one of the commonest of the family in North China, whence its range extends into Southern and Western Manchuria.

It is much smaller than any of the other larks, and has a short, almost finch-like bill, while it is of a pale sandy colour with light markings. It measures under 5.5 inches in length.

* Swinhoe, *P. Z. S.*, 1863, p. 89.

74. Short-toed Lark.

Calendrella brachydactyla, (Leisler).

Alauda brachydactyla, Leisler, Wetterau Gessellsch, Ann., III, pp. 357-359, 1814.

The short-toed lark is an inhabitant of North China and South Manchuria.

It is a small bird of a brown colour, spotted with dark brown on the upper parts, lighter below, with a little deeper shade on the chest, and dark brown patch on either side. The toes are short and the hind claw unusually so. Length 5.5 inches.

La Touche records it from Chin-wang Tao, North-east Chihli.

75. Rufous Short-toed Lark.

Calendrella brachydactyla dukhunensis, (Sykes).

Alaudula dukhunensis, Sykes, Proc. Comm. Sci. Zool. Soc. Lond., II, 1832

As I secured specimens of this lark in Southern Mongolia, at no very great distance from the Manchurian border, it seems probable that it occurs also in the latter country.

It is slightly larger than true *brachydactyla*, and is of a richer, more rufous colour, particularly on the chest; while the upper plumage is more coarsely mottled with black. Length 6 inches.

76. Horned Lark.

Otocoris alpestris flava, (Gmelin).

Alauda flava, Gmelin, Syst. Nat., I, p. 800, 1788.

This handsome bird is not very common in these regions, though at times it appears in winter in great numbers. It occurs in Manchuria on the plains in the west, especially in winter, where also its near relative *O. a. brandti*, Dresser, also occurs.

It has the plumage of a beautiful fawn, approaching dove-grey on the back of the head, nape and upper parts, and passing into buffy-brown on the wings and the two central tail-feathers; the other tail-feathers are black, the outer edges of the two outermost being white; the forehead, eyebrows and throat are of a pale

sulphur yellow, as also are the ear-coverts; while the anterior portion of the crown is black, the black extending along the side of the crown and the upper edge of the tufts, which stick up at the side and back of the head and give the bird its name; the gorget is black, and a black streak extends from the base of the bill, below the eye to a spot below the ear; the breast is white tinged with fawn.

La Touche has secured this bird at Chin-wang Tao.

77. Siberian Horned Lark.

Otocoris alpestris brandti, Dresser.

Otocoris brandti, Dresser, Birds of Europe, IV, p. 397, 402, 1874.

This lark closely resembles the foregoing, but may at once be distinguished by the forehead, eyebrow, ear-covert, and throat being pure white instead of pale yellow, and in the plumage of the upper parts being lighter and more of a fawn-grey.

I have secured this species during the winter in the vicinity of Tientsin, and it has also been obtained near Peking and at Chin-wang Tao.

There can be no doubt that it was the bird meant by Swinhoe in his short description in 1871, for he says, quoting David, that it comes down to Peking from Mongolia. He also says that it differs from *O. a. flava* in having a white face. The name *sibiricus* used by him appears not to be available, and so I follow Hartert in giving that used by Dresser.

Picarians.

Family Picidæ.

The next family of birds that come under our heading of residents in the Manchurian Region, is that of the *Picidæ* or woodpeckers, many of which are purely non-migratory, others only partially so; though there are, of course, some purely migratory forms. Of the last, however, there are very few, for woodpeckers, though largely dependent upon an insect food, manage very well in a cold wintry climate. Their powerful chisel-like bills enable them to tear away the wood of dead and rotting trees to get at the succulent wood-boring grubs of beetles, and certain forms of wasps and moths. To see the great black woodpecker (*Dryocopus martius*)—*Picus martius* of authors—working upon some dead pine, driving his strong bill under the bark, and splitting off great

slivers, sometimes a couple of feet in length, is a revelation of bird development and adaptation. But woodpeckers do not depend on insect food alone, nuts, the kernels of stoned fruit, and other such food is often eaten by them, as I have proved by an examination of their stomachs. I have also seen the grey-headed woodpecker, *Picus canus* and its subspecies—*Gecinus* of authors and many recorders—delving into the ground for ants and other insects. Thus the fact that they can secure a living during the colder months in these northern regions renders them content to stay. It may be noted of the woodpeckers that always migrate south in the autumn to spend the winter in more genial climes, that their bills are not of the strong, chisel-like order, but are weaker and less fitted for the task of extracting grubs from the tough, unyielding dead-wood. The buff-bellied woodpeckers (*Hypopicus*) and the wryneck (*Jynx*), a related picarian form, exemplify this characteristic, and are purely migratory.

Many of the Manchurian woodpeckers are representative of the European forms, others are purely oriental.

78. Great Black Woodpecker.

Dryocopus martius reichenowi, Kothe.

Dryocopus martius reichenowi, Kothe, Orn. Monatsb., June, 1906, p. 95.

The Manchurian representative of the great black woodpecker, is very closely related to the European form, of which it is a subspecies.

It is a large bird of a pure, but dull, black colour, with a fine crimson red patch on the crown in the male, a smaller patch of the some colour occurring on the back of the head of the female; the bill is long, powerful, wide at the base and of a blue-grey colour; the eye is white; the feet grey.

There appears to have been some question as to whether there is a distinct eastern form of *D. martius*, Hartert, Clark, and others being inclined to doubt it. Mr. Riley, however, points out in a paper published in the *Proceedings of the Biological Society of Washington* (Vol. XXVIII, pp. 161-164, Sept. 21, 1915), in which he names a new subspecies *D. m. silvifragus*, from Hakodate, (Yeso), that the eastern form is much larger than the western form, "and is also of a deeper slaty black." He had for comparison eight specimens from Europe, a specimen of mine from Manchuria, and

another from the Imperial Hunting Grounds, or Tung Ling (Eastern Tombs) in North Chihli, which I secured in the early spring of 1914, and in which place the bird is very common.

Clark records the bird from near Korsakoff, Saghalin Island, and remarks that a specimen in the United States National Museum taken by Dr. Stejnger at Cape Patience, Saghalin, agrees perfectly with examples from Europe. This bird is, apparently, the one that Riley, in his paper, places with the Yeso form, *silvifragus*, which has a larger bill than the European form, but is smaller than the mainland form, *reichenowi*.

The great black wood pecker is abundant in the Manchurian forests, though difficult to approach. I encountered this bird in the West Kirin forest as well as the in the I-mien-p'o district of the north. Ingram records it from the Khingan Mountains.

In habits it agrees with most of its family, living a purely arboreal life, depending for its food largely upon the insects and larvæ that it extracts from the standing dead-wood of the forest, and nesting in deep holes, which it bores with its powerful bill in the same.

79. White-breasted Black Woodpecker.

Triponax richardsi, (Tristram).

Dryocopus richardsi, Tristram, Proc. Zool. Soc. Lond., 1879, p. 386, pl. 31.

This large and handsome bird was described from Corea, but though it has not been actually recorded from outside that country it seems not improbable that it may occur at least in South Manchuria.

The back, wings and tail are black; the breast and belly white; the crown and crest a fine crimson red.

80. Corean Grey-headed Woodpecker.

Picus canus griseoviridis (Clark).

Gecinus canus griseoviridis, Clark, Proc. U. S. Nat. Mus., Vol. 32, p. 473, 1907.

The grey-headed woodpeckers, of which a number of more or less distinct subspecies occur in our region, replace in these parts the green woodpecker of Western Europe.

The true distribution of the eastern forms or subspecies of *Picus canus canus*, Gmelin,* whose range is from Norway into Siberia, is somewhat obscure; but, after a careful examination and comparison of specimens in the British Museum collection from Japan, Yezo, Saghalin Island, the Amur and Ussuri Rivers, Corea and various parts of North China, I am forced to the conclusion that Corea, Manchuria, except perhaps the extreme south and south-west, and the Amur and Ussuri basins are occupied by Clark's *P. c. griseoviridis*, that Japan, Yezo, and Saghalin Island are occupied by Stejneger's *P. c. jessœnsis*, and that North and North-eastern China and South-west and South Manchuria are occupied by Reichenow's *P. c. zimmermanni*.

P. c. griseoviridis was originally described by Clark from specimens collected by Louis Jouy in Corea. Of a general green colour, it has the head and neck grey with a crimson patch on the back of the head in the male, absent in the female, with heavy black streaks on the head in the male, lighter ones in the female, the breast and under parts dull greyish-green, the back deep and bright green, shading into yellow-green on the lower back and rump, and black mustache streaks. It is rather a large bird.

Specimens secured by me in Kirin have been referred to this subspecies, while all those examined by me in the British Museum from the Amur, Ussuri and Corea agree with Clark's description and with each other. Ingram records *Gecinus canus* from "Shinking," (Fengtien).

81. Japanese Grey-headed Woodpecker.

Picus canus jessœnsis, Stejneger.

Picus canus jessœnsis, Stejneger, Proc. U. S. Nat. Mus. IX, p. 106, 1886.

This form is distinguishable from the foregoing by its considerably smaller size, its bright but lighter green upper parts, lighter breast and lower parts, and the fact that the head is only lightly streaked with black in the male, and plain in the female. Birds from Saghalin, Yezo, and Japan in the British Museum

* Syst. Nat., I, 1, p. 434, 1788.

collection all agree in displaying these characteristics. Hartert gives this form as inhabiting the Ussuri and Manchuria, but in this he is undoubtedly mistaken. The bird is a small, bright, island form.

82. North China Grey-headed Woodpecker.

Picus canus zimmermanni, Reichenow.

Picus canus zimmermanni, Reichenow, Orn. Monats., 1903, p. 86.

This is the form that occurs in North China and thence spreads into neighbouring South-western and Southern Manchuria, and possibly up through Western Manchuria as well.

It is a large bird, if anything a little larger than *P. c. griseoviridis*. Its plumage is paler and less bright than in either of the foregoing, more greyish on the back even in its brightest plumage. The black streaks on the head in the male are very numerous and form into a conspicuous black patch on the back of the head and nape. I examined specimens in the British Museum collection from Chin-wang Tao in North-eastern Chihli, close to the Manchurian border, Shansi and Shensi, all of which agree in the above characteristics. The type was from Tsing-tao in Shantung.

One of the chief difficulties in the way of arriving at a proper understanding of the distribution of these birds is the marked seasonal variation, to which their plumages are subject. A bird at one time of the year may be bright green, at another dull green and at another almost grey. But such characteristics as size and the black markings on the head, may be taken as sufficiently reliable to base our classifications upon.

83. Eastern Great Spotted Woodpecker.

Dryobates major tscherskii (Buturlin).

Dendrocopus japonicus tscherskii, Buturlin, Nasa Ochota, July, 1910, p. 53.

There are a number of wood peckers that occur in Eastern and Northern China, Manchuria, and Corea of spotted or pied plumage, which to a casual observer would be difficult to distinguish one from another, yet which on a close examination reveal distinct and permanent differences.

One of the commonest of these is the eastern form of the great spotted woodpecker, which differs from the European species in having the white underparts washed with a dirty buff-brown, and the lores with buff.

The crown, back, and central retrices are black, a black band extending on to the chest, and a black line passing from the base of the bill below the lores to the back of the head; the wings, and the rest of the tail feathers are black and white; the scapulars are white; the forehead, cheeks, taking in the eye, lores, throat, breast, and flanks are a white, washed with dirty buff-brown; the back of the head in the male is of a fine crimson colour; the abdomen and under tail-coverts in both sexes also crimson. The bird is just over 9 inches in length, the bill being 32 mm.

I have secured specimens of this bird from Tientsin, and the Tung Ling in Chihli, and in the I-mien-p'o forested district of North Kirin in Manchuria.

In the last named place it was very common in autumn.

Ingram records *D. major* from Mendukei in the Khingan Mountains.

Another subspecies, *D. m. brevirostris*, has been described by Reichenbach, but of this form I can not speak.

84. Chinese Spotted Woodpecker.

Dryobates cabanisi cabanisi (Malherbe).

Picus cabanisi, Malherbe in Cabanis' Journ für Orn. 1854, p. 172.

This form which is common all over North and East China differs from the foregoing in one or two points, chief of which is the markedly smaller extent of the white upon the wing-coverts, and the back, instead of white scapulars. The spots of white on the flight feathers also are smaller and rounder in *cabanisi;* while the underparts are more of a brown colour, the crimson of the lower parts extending right on to the breast, and appearing even on the chest. In one specimen I have from Tientsin the white on the forehead, lores, and lower parts is almost free from the brown-buff washing. The tail in *cabanisi* is longer than in *tscherskii*, and has the side feathers buff barred black, instead of almost white barred black.

I have secured specimens of this bird in Tientsin, at Yu-lin Fu on the Ordos-Shensi border, and in South-west Shensi, and I also have a specimen from Fu-chou, south of the Yang-tzu. Its presence in North-eastern Chihli makes it almost certain that it occurs in South-western Manchuria.

85. White-backed Spotted Woodpecker.

Dryobates leucotos uralensis (Malherbe).

Picus uralensis, Malherbe, Mongr. Picidées, I, 1861, p. 92, pl. 23, fig. 4 and 5.

Specimens of a large white-backed woodpecker taken by me on the Yalu River, and at I-mien-p'o in North Kirin, have been referred to Malherbe's subspecies *Dryobates leucotos uralensis*, This is a much larger bird than either of the two foregoing species, measuring 10½ inches. It has the crown, nape, sides of the neck, upper back, upper tail-covert, and the four central tail-feathers black, a black streak running from the base of the bill below the lores to the side of the neck, and a black patch occurring on each side of the chest; the wings are black, barred, or spotted bars, with white; the forehead, sides of the head, lores, breast and lower back are white, the forehead and lores being washed with buff, and the breast and flanks being streaked with black; the side feathers of the tail are buff-white spotted with black; the back of the head in the male is crimson, the lower breast, belly and under tail-coverts in both sexes a crimson-rose.

One other subspecies of the white-backed wood-pecker has been named from the Manchurian Region, though it appears to be a very doubtful one. I refer to Buturlin's *Dryobates* (later *Dendrodromas*) *leucotus ussuriensis* (Mitth. Kauk. Mus. Vol. III, pt. 1. April, 1907, pp. 47-62, and *Ann. Mus. Zool. Acad. Imp. Sci. St.-Péters., Vol. XIII*, 1909, p. 233.), described from specimens taken at Sidemi in the southernmost part of the Ussuri region, and which Clark said is identical with his (Clark's) *Drybates leucotos coreensis*, described in the *Proceedings of the United States National Museum* Vol. XXXII, June, 1907, p. 472, from specimens taken by Jouy at Fusan, Corea.

Ingram records *Dendrocopus leuconotus*, Bechst. from the Khingan Mountains; while James, in 1886, secured specimens, which Ingram refers to this species, from the Pei-shan range in South Kirin.

This woodpecker, which is the largest of the spotted or pied forms in these parts, is essentially a forest bird. I often saw it in the forests round I-mien-p'o, where it was more common on the low-lying areas than at higher altitudes.

86. Lesser Spotted Woodpecker.

Dryobates minor minutillus (Buturlin).

Xylocopus minor minutillus, Buturlin, Ann. Mus. Zool. Acod. Imp. Sci. St.-Péterel. XIII, 1908, p. 246.

This handsome little bird, a specimen of which I obtained at I-mien-p'o is not at all common outside the forest area, where its place seems to be taken by the pigmy woodpeckers, another genus of small species generally known as *Yungipicus*.

The lesser spotted woodpecker has the back of the head, upper back, wing-coverts, upper tail-coverts, and four central tail-feathers black; the rest of the wings black barred with white; the middle back white lightly barred with black; the sides of the neck and the throat white; the forehead, lores, chest, and breast white suffused with a dirty buff, the chest being lightly streaked with black, the lores divided from the throat by a black band; the side tail-feathers white, buff tipped and barred black; the crown crimson in the male.

The length of this bird is just over 6 inches. Buturlin has described another larger form from the Amur under the name *D. m. amurensis;* while Ingram records a form under the name *D. minor* from the Khingan Mountains.

87. Spark-headed Woodpecker.

Yungipicus scintilliceps, Swinhoe.

Yungipicus scintilliceps, Swinhoe, Ibis, 1861, p. 340.

The pigmy woodpeckers are an interesting group of small woodpeckers that occur in Eastern and Southern Asia. North China, and South-western Manchuria, at least, are occupied by a species known as the spark-headed woodpecker, on account of its having a few red or crimson feathers on each side of the back of the head instead of the patch of crimson so common in the family *Picidæ*.

The crown, nape, upper back, and wings of this bird are black; the middle, and lower back being white, barred with black, or grey; the wings being spotted with white, though not so much as in the

foregoing species; the cheeks, throat, and sides of the neck are white; the forehead and lower parts brown, the chest and breast being streaked with black.

The length is nearly 6 inches.

88. Seebohm's Pigmy Woodpecker.

Yungipicus kizuki seebohmi, (Hargitt).

Iyngipicus seebohmi, Hargitt, Ibis, 1884 p. 100.

In Jouy's collection are a pair of this species taken at Seoul in July, and October. It is related to the Japanese pigmy woodpecker *Y. k. nigrescens*, described by Seebohm. It differs in having more white in the plumage, and the top of the head being ashy grey instead of brown. It has a rufous brown gorget, the rest of the under surface being white. It is thus very different from *scintilliceps*. The length is given as 5.3 inches.

89. Amur Spark-headed Woodpecker.

Yunipicus scintilliceps doerriesi, (Hargitt).

Iyngipicus pygmæus doerriesi, Hargitt, Ibis. 1881, p. 398.

This species, which differs but little from the Chinese form, was described from the Amur. I did not meet with it anywhere, but this is, doubtless, because I did not do any collecting on or near the plains. Jouy's collection from Seoul contains a number of specimens of this bird.

It differs from *scintilliceps* in having the middle and lower back entirely white, and not barred; while the under parts are of a much lighter brown. It is also larger than *scintilliceps* being 7.5 inches in length.

90. Three-toed Woodpecker.

Picoides tridactylus sakhalinensis, Buturlin.

Picoides sakhalinensis, Buturlin, Orn. Monatsber., XV, 1907, p. 10.

Ingram records a three-toed woodpecker from Manchuria under the name of *P. t. crissoleucus*, Reichenbach, from the Khingan Mountains, where several specimens were secured; it is probable that they are referrable to Buturlin's subspecies *P. t. sakhalinensis*.

This bird may be recognized by its having only three toes. The forehead is black and white; the crown yellow; the sides of the head white; sides of the neck, and nape black, with a black mustache stripe; the back, wings, and tail black, with white spots on the primaries, and white bars on the outer tail feathers; the breast a dull white; the bill dark grey; legs greyish. Its length is about 9 inches.

CHAPTER II.

Birds of Prey.

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The birds-of-prey form a group that it is not easy to fit into our scheme for dealing with the birds of the Manchurian Region, for as a class they can be called neither strictly residential nor purely migratory.

As already stated many of them follow the hordes of smaller migrants from one region to another, and so become migrants themselves, but it may be noted that amongst these there are nearly always members that elect to spend the winter in the more northerly regions, and so bring the species to which they belong under our heading of residents.

Some species, such as the Amur red-footed falcon (*Erythropus vespertinus amurensis*, Radde), forsake the Manchurian Region entirely at the approach of winter; while one, the snow owl (*Nyctea nyctea*, L.), is only a winter visitor.

As however, the majority of the *Rapaceæ*, or birds-of-prey, can be classed as residents, I have decided to deal with the whole group from the owls, (*Strigidæ*) to the vultures, (*Vulturidæ*) here.

Family Strigidæ.

This owl family, as regards the Manchurian Region, is a difficult one in which to determine the number of species that occur there. With their nocturnal habits, and by reason of their hiding up during the day, they are not easy to observe and less easy to collect as specimens, and when one does stumble across them it is generally by accident. It becomes necessary, then, to fall back upon surmise to a certain extent, and to base our list upon the records of birds from neighbouring regions, with which the topography of our country is connected. It is safe to conclude that the owls that inhabit North-eastern China also occur in South-western Manchuria, that those of Siberia occur in the Amur, and probably also in Heilungkiang and Primorskaya, and that any species recorded from Corea occur at least in South Manchuria.

It will be noticed that Buturlin has described most of the owls recorded from the Ussuri as subspecies of more or less well known Siberian forms, but so slight are the differences that we should not have been justified in making of the Manchurian Region a separate and distinct avi-faunal sub-region. To do that it would require an avi-fauna very much more distinct and characteristicly different from those of neighbouring regions than is that of Manchuria.

The owls as a whole are non-migratory or only very partially so. The most noticeably migratory are the long-eared and short-eared owls, both of which follow the migrations of the small passerines and do much havoc; while the snow owl, appearing only in severe winters, is purely migratory as regards Manchuria.

91. Manchurian Wood Owl.

Strix uralensis nikolskii (Buturlin).

Syrnium uralensis nikolskii, Buturlin, Mess. Orn., I, 1910, p. 333.

The forests of the Manchurian Region are the home of a large form of wood owl, which Buturlin has described as a distinct subspecies of the Siberian wood owl under the above name. It may be considered as the eastern form of *Strix uralensis*, and is related to *S. fuscescens*, T. and S., which does not appear to occur in our region. Clark has named a subspecees *S. u. japonicum* from Yezo and another *S. u. hondoensis* from Hondo (Japan).

The upper parts are dark brown, vermiculated and spotted with whitish markings; the long wing and tail feathers are darker brown, and are barred with white or buff white; the throat, breast, and belly are buff-white, streaked and barred in the manner characteristic of owls generally with dark brown; the face discs are whitish with a dark brown, almost black line dividing them; the feet are feathered, and lightly barred; the bill is a pale yellow; the eyes a dark brown; the tail is long and broad.

An inhabitant of the forested areas, this fine bird is fairly common. I often heard it while camping and hunting in the Kirin forests, and on more than one occasion saw it, though I secured only one specimen.

Buturlin described it from the Ussuri; while Schrenck records *Strix (Ulula) uralensis*, Pall., from the Amur.

The Manchurian Wood Owl (*Strix uralensis nikolskii*, But.), I-mien-po district, N. Kirin.

Nest of the Great Crested Grebe, anchored to a half-submerged tree in one of the Crater Lakes of the West Kirin Forest.

92. Corean Brown Owl.

Strix aluco ma, (Clark).

Syrnium ma, Clark, Proc. U. S. Nat. Nus., Vol. 32, 1890 (1907) p. 471.

Clark described this owl from a specimen taken by Jouy at Fusan, Corea. Elsewhere he states that Buturlin called his attention to the fact that his new species is probably the form described and figured by David and Oustalet (Oiseaux de la Chine, 1877, p. 45, pl. 2.) as *Ptynx fuscescens*, T. and S. These authorities were apparently wrong in their diagnosis of the species, which occurs in North China, Manchuria, and, as shown by Jouy's specimen, in Corea; and it must now be known under Clark's name of *Strix ma*.

The plumage on the upper parts is a mixture of brown and grey with extensive white markings on the scapulars; facial discs grey with border of brown; the lower parts white with the centres of the feathers irregularly marked with brown; the tail brown, tipped with white, and barred with whitish; wing-coverts brown; quills barred grey and chestnut brown.

It is probable that this bird occupies South Manchuria, while *S. uralensis nikolskii* occupies the centre, north, and east.

Taczanowski records it from Corea under the name of *Syrnium nivicolum*, Blyth. Hartert gives it under this latter name as a synonym with a querie. It is probably a subspecies of *Strix aluco aluco*; the true tawny owl.

93. Great Grey Owl.

Scotiaptex nebulosa barbata (Pallas).

Stryx barbata, Pallas, Zoogr. Rosso-Asiat., I, 1811 (1827), p. 318.

This is apparently the *Syrnium lapponicum* of authors, which is known to have a range extending from Europe right across Northern Asia, and doubtless into the Manchurian Region.

It has no ear-tufts. The upper parts are blackish, finely marked with white, the lower parts being blackish, streaked with white; tail barred; eyes and bill yellow, legs and feet feathered to the claws; length 27 inches. Buturlin has described *S. n. sakhalinensis*, from Saghalin, which subspecies has been admitted by Hartert. (p. 1016 Vog. Pal. Fauna).

94. Hawk Owl.

Surnia ulula pallasi, Buturlin.

Surnia ulula pallasi, Buturlin, Orn. Monatsber, XV, 1907, p. 100.

This owl has been described as a subspecies of the Siberian hawk owl by Buturlin from the Ussuri under the name *Surnia ulula pallasi*. Poljokov also recorded it from the same region.

The true hawk owls differ from the Oriental hawk owls, a totally different genus (*Ninox*), in being more hawk-like in appearance, though the wings are comparatively shorter. The bill is powerful; the ear cavity small; the face discs almost completely suppressed; and the plumage hard and compact, instead of soft as in most owls. The barred breast lends a further resemblance to a hawk. The upper parts are dusky, or greyish-black, the crown being closely spotted, the back mottled, the tail barred with white. The breast and lower parts are white, closely barred with dusky.

The hawk owl is diurnal in its habits. It apparently makes little or no attempt to build a nest, laying its eggs in some hollow tree upon the soft, rotten wood. It is a great enemy of the hazel grouse and other game birds of the forested areas.

95. Swinhoe's Little Owl.

Athene noctua plumipes, Swinhoe.

Athene plumipes, Swinhoe, Proc. Zool. Soc. Lond., 1870, (June 9), p. 448.

The little owl, which occurs all over North China, and in Western and Southern Manchuria, at least, differs but little from its European relative *Athene noctua*. It is, however, more of a sandy or buff brown colour; while the feet and toes are very much more thickly feathered. The plumage is studded with large round dots of a pale buff-white or white colour, getting smaller on the head, and more irregular on the breast; the feet are a pale buff colour; the eyes a light lemon-yellow; bill horny yellow.

It is an inhabitant of the plains and low, barren hills, where it frequents low banks and earth ridges. I once secured a specimen on the Tai-yuan Fu plain, Shansi, from a hollow in a tall elm tree, but such a resting site is unusual. It is partially diurnal, and may often be seen abroad on dull days. It is non-migratory.

I secured a specimen of this species in the Tientsin vicinity.

96. Eastern Pigmy Owl.

Glaucidium passerinum orientale, Taczanowski.

Glaucidium passerinum orientale, Taczanowski, Faune Orn. Sib. in Mém. Aced. Imp. Sci. St. Peters. Ser. 7, 1891, p. 128.

This pretty little inhabitant of the Manchurian forest may at once be recognized by its very small size, and distinctive greyish plumage. The head and back are grey-brown, with small white dots on the head, increasing in size on the back and wing coverts, and becoming white bars on the tail; the retrices, and primaries are browner than the upper parts; the breast is white streaked with blackish-brown; throat grey with dark bars; the face discs grey spotted with dark brown or blackish; bill yellow; eyes light lemon-yellow; claws black; legs covered with white feathers.

I secured a specimen in the I-mien-p'o forest. Buturlin records it from the Ussuri. Schrenck records *Strix (Athene) passerina*, from the Amur.

97. Tengmalm's Owl.

Cryptoglaux tengmalmi sibirica, Buturlin.

Cryptoglaux sibirica, Buturlin, Nascha Ochota, June, 1910, p. 78.

All four forms of the circumpolar so-called Tengmalm's owl, the *Nyctala tengmalmi* of authors, described by Buturlin are very much alike, and hardly to be separated, even after the most careful examination of a large series. Buturlin's forms are (1) *caucasicus*, from the North Caucasus, (2) *sibiricus*, from the Ussuri, Mid-Siberia and Zungaria, (3) *jakutorum* from Yakutsk and North-eastern Siberia, and (4) *magnus* from Kamschatka. I shall not try to distinguish between these four forms, but, accepting them as geographical races, list *sibirica* as the form that occurs in the Manchurian Region. The type of this subspecies was from Lake Hanka at the head of the Ussuri Valley.

This owl may be recognized by its small size, soft, greyish-brown, mottled white plumage, and the absence of any ear-like tufts. Its general colour is greyish-brown above mottled with white, greyish below, barred or streaked with brown. The crown

is darker, thickly covered with small white dots, the face-discs grey, edged with dark brown. The bill is greenish; feet greyish; eyes yellow.

Hartert gives the length of the wing in this form as 176 to 178 mm., and says that it is easily distinguished by a rather fainter, less brown and slightly greyish tinge of the upper parts, as well as by the spots on the lower sides, which is somewhat vague at the best. In examining a series of specimens in the British Museum, from all parts, I did not find it possible to make out any very persistent or reliable differences between the birds from various areas.

98. Ussurian Oriental Hawk Owl.

Ninox scutulata ussuriensis, Buturlin.

Ninox scutulata ussuriensis, Buturlin, Mess. Orn., I, 1910, p. 187.

Three specimens of this owl were obtained by James in 1886 in Manchuria, and were considered to belong to the Japanese form *N. s. japonica*. Since Buturlin described the Ussurian form Ingram has classified James' specimens as belonging to it.

The Oriental hawk owls are an interesting group of birds not to be confused with the genus *Surnia*, from which they differ considerably in both appearance and habits. They keep very much to the wooded areas, where they build their nests in hollow trees.

Their general appearance, as the name suggests, is somewhat that of a hawk, for the wings are longer and more pointed than is usual with owls, while the head is smaller, and the face-discs less developed. The plumage is less soft than in other owls. They are, however, not so hawk-like as the true hawk owls (*Surnia*). Our present species is of a dark brown colour, spotted or streaked with white on the breast, and having darker bars on the tail. It is not a large bird, being between the short-eared owl and the little owl in size.

99. Long-eared Owl.

Asio otus otus, (L.)

Strix otus, L. Syst. Nat. I. p. 132, 1766.

So well known a bird as the long-eared owl, which seems to be found in all palæarctic countries, needs little description here. It may easily be distinguished by its long wings and long ear-like tufts. Its plumage may be described as of a general yellowish-

brown colour, with that peculiar indefinite mottled appearance characteristic of so many owls. It may be distinguished from the other member of the genus *Asio* that frequents these parts, the short-eared owl, by its long ear-like tufts, and its more indefinitely marked plumage.

It is to a considerable extent migratory, but I have found it wintering well north in North China, and it probably winters at least in South Manchuria. Frequenting the open country, it is one of the commonest owls in these parts, and in common with the short-eared owl is often put up by sportsmen, sometimes even in marshy districts.

100. Short-eared Owl.

Asio flammeus (Pontoppidan).

Strix flammea. Pontoppidan, Danske Atlas I, p. 617, Taf. XXV, 1763.

The short-eared owl that frequents the Manchurian Region, like its congener, the long-eared owl, is indistinguishable from the European form, commonly known as *Asio accipetrinus* of Linnæus, but really referrable to the older name of *A. flammeus* of Pontoppidan.

It may readily be distinguished from the foregoing by its short ear-like tufts, and its plumage being more definitely streaked with black. Otherwise the two forms are much alike.

Like the short-eared owl it follows the migrations of small passerines, killing large numbers. It is thus often taken on board of ships crossing the Pe-chi-li Gulf and following the China Coast.

I have secured it in winter in North China. Ingram records it from the Khingan Mountains.

101. Ussurian Great Eagle Owl.

Bubo bubo ussuriensis, Poljakow.

Bubo bubo ussuriensis, Poljakow, Zur Ornith. Fann. des Uss.-Geb. in Mess. Orn. 1915, pp. 44 and 45.

The eagle owls are distinguishable at once from the rest of their kind by their great size, and fine, brown, well-marked plumage. They have long ear-like tufts.

In our subspecies the crown is dark brown; the back is brown well marked with dark brown or black in irregular streaks down the mid-ribs of the feathers; the wings and tail are lighter, more sandy-brown, the feathers being barred with dark brown; the breast is sandy-buff, each feather having the mid-rib area darker, and the web lightly and closely barred. The eyes are large and of a fine orange colour; the legs, and toes are completely feathered with soft light buff feathers; the claws long, powerful, and black. The bill also is black.

There seems to be a good deal of doubt as to the correct names for these birds, but the one used, being that given by Poljakow in separating the Ussuri form, is applicable to the Manchurian form; unless, of course, it is found that all these eastern forms are indistinguishable, in which case Schlegel's name *sibiricus** would be the correct one.

The latter is described, however, by Hartert as a lighter form than *bubo*, and more whitish than Buturlin's *ruthenus*. Buturlin also describes *B. b. doerriesi* (Nascha Okhota, June, 1910, p. 78) and *B. b. jakutensis*, both of which are given by Hartert in his "Birds of the Palæarctic Fauna." In addition to these we have Clark's *B. b. tenuipes* (*Proc. U. S. Nat. Mus. XXXII*, p. 470, 1907) from Corea, which was described as darker than true *bubo*, and also smaller.

The eagle owl is also known to occur in Mongolia, and a specimen taken by me in the Ordos Desert region has been identified as belonging to Eversmann's *B. b. turcomanus*. This is a lighter and more yellowish form, and it is probable that its range extends into Western Manchuria, as is the case with so many other Mongolian species.

Thus, supposing all these forms to be genuinely distinct, it is possible that the Manchurian Region may be found to contain the following forms:

1. *Bubo bubo ussuriensis*, Poljakow, a rather dark form occupying the Ussuri, and probably the Amur and Sungari basins.

* Schleg. and Susem., Vögel Europ. Taf. 44, 1843.

2. *B. b. turcomanus*, Eversmann, a lighter more sandy-yellowish form, occupying Dauria and Western Manchuria.
3. *B. b. tenuipes*, Clark, a smaller, darker form, occurring in South Manchuria, along the Yalu basin.,

with a possibility of Buturlin's *B. b. jakutensis* extending into the northern parts of the Amur.

The eagle owl is fairly common throughout Manchuria, where I often heard its characteristic hoot. I saw a single specimen while camped on the banks of the Upper Sungari in Central Kirin.

102. Blakiston's Eagle Owl.

Pseudoptynx blakistoni dœrriesi (Seebohm).

Bubo blakistoni dœrriesi, Seebohm, Proc. Zool. Soc. Lond., 1883, p. 466.

This is probably the largest owl known. It is related to the other eagle owls, which it resembles in its plumage, but is distinguishable by its great size and naked toes.

Our subspecies, which was described from the Ussuri, is very like true *blakistoni* from Yezo, but has a large pure white spot on the head, the tail being less regularly coloured, there being incomplete, and interrupted dark brown bands on the middle and outer retrices, those in between being almost entirely cream coloured with dark spots and points towards the tips, and very few complete bands. The length of a male, according to Taczanowski, is 522 mm.; tail 225 mm.; culmen 55 mm.

The nearest relative to *blakistoni* and its subspecies is said to be *Bubo coromandus* from North India.

103. Ussurian Scops Owl.

Otus bakkamœna ussuriensis, (Buturlin).

Scops semitorques ussuriensis, Buturlin, Mess. Orn., I, 1910, p. 119.

From the greatest of the owls we turn to the least, the little scops owls. These are at once distinguishable from all the other small owls by the presence of ear-like tufts, which are absent in *Athene*, and *Glaucidium*. They are mostly of a dark colour, their plumage being mottled much as in the nightjars. They are fierce little marauders, and I have watched one capture and kill a sparrow

with great skill, notwithstanding the fact that its prey was not far short of it in size. These birds measure about 8 inches in length. The plumage is of a dark grey brown more or less uniformly mottled all over as already stated. Feathers extend down the leg to the feet, the toes being only very slightly feathered.

This species was described by Buturlin from the Ussuri.

104. Japanese Scops Owl.

Otus japonicus, (T. and S.)

Strix hirsuta, var. japonica, T. and S. Fauna Japonica, Aves, p. 29, pl. 96, 1850.

Ingram recorded what was probably this bird from the Khingan Mountains under the name of *Scops giu stictonata*. It is the form that occurs throughout North China.

Of a dark brownish colour, it is mottled with grey and lighter markings: the eyes are a light yellow. La Touche records it at Chin-wang Tao as a migrant.

105. Snow Owl.

Nyctea nyctea, (L.)

Strix nyctea, L., Syst. Nat. I, p. 132, 1766.

The handsome snow owl, which, of course, really belongs to the Arctic avi-faunal sub-region, visits the Manchurian Region only in winter. Under unusually severe winter conditions it finds its way as far south as North-eastern Chihli. Mr. La Touche tells me that he had a specimen, that had just been killed, and was still warm, brought to him on December 16th, 1916, at Chin-wang Tao.

Schrenck records it from the Amur.

It is a large bird, though not so large as the eagle owl, from which it further differs in having no ear-like tufts, and in its white plumage.

Family Pandionidæ.

This family is represented by but the one species, the osprey, which is found throughout northern regions in both hemispheres, though represented in the New World by a distinct subspecies.

106. Osprey.

Pandion haliaëtus haliaëtus, (L.)

Falco haliaëtus, L., Syst. Nat. I, p. 129, 1766.

The single specimen which I secured on the Upper Sungari River in Central Kirin is indistinguishable from the European form.

With its dark blackish-brown upper parts, white lower parts, and white on the head, and above all its white feet, the osprey is easily distinguishable from all other birds of prey.

It spends its whole time in summer flying over large rivers, lakes, and marshes, and catching fish by swooping down into the water and seizing its prey as the latter comes to the surface.

It builds a large nest high up on a tree upon some cliff. In winter it repairs to the sea, usually travelling southward, though it remains as far north as the seas that wash the South Manchurian Coast. I have seen it in the Pe-chi-li Gulf in winter.

It is recorded by Schrenck from the Amur region.

Family Falconidæ.

This family includes the gerfalcons, peregrine, hobby, merlin, red-footed falcon, and kestrils, all of which are characterized by the great length of their wings, and the comparative shortness of their legs. They are all fast flyers, and as compared with other members of the order *Accipetres* are fierce and daring. They will readily attack birds much larger than themselves, and on that account have always been looked upon with especial favour by those who indulge in the sport of falconry. The family is represented in the Manchurian Region by some seven species and subspecies.

107. Kite-footed Ger-falcon.

Hierofalco cherrug milvipes, (Jerdon.)

Falco milvipes, Jerdon, Ibis, 1871, p. 240.

Falco milvipes, Hodgson, in Gray's Zool. Misc. p. 81, (figure), 1846.

This bird has been confused with the saker falcon, (*Hierofalco saker*) which it closely resembles, but from which it may be distinguished by its light, almost cream-white feet. It is also lighter and has more white in its plumage than *saker*.

A large fierce bird, this falcon has very light plumage, speckled with brown: the head is almost white; the tail light and strongly barred with grey-brown; the back and wings are brown, slightly speckled; the feet are a very light, pale yellowish-white or cream-white; the eyes are light yellow, as also is the cere.

When travelling in Southern Mongolia I found this fine bird breeding, though I did not secure any eggs, the nests were usually laid on the ground amongst the rocks, and in the long grass or stubble on the crests of low hills, that are characteristic of that country.

Schrenck records *Falco gyrfalco*, L. from the Amur.

Two other gerfalcons that might occur in Manchuria are *H. rusticolus uralensis*, Severtzov and Menzbier, and *H. altaicus*, Menzbier.

La Touche records *Falco sacer* from Chin-wang Tao as a migrant.

108. Manchurian Peregrine Falcon.

Falco peregrinus harterti, Buturlin.

Falco peregrinus harterti, Buturlin, Mess. Orn., II, 1911, p. 58.

Buturlin has described the peregrine that occupies these regions as a distinct subspecies under the above name. There is, however, very little difference between it and the European form, and at best it appears to be but a geographical race. Hartert himself gives it as a synonym for Latham's *F. p. calidus*.

The male is dark grey on the head, back, wings and tail; the throat is white, the white extending on either side of the head below and behind the dark streak, which extends from the base of the bill backwards and downwards; the breast and belly are light grey almost white, closely barred with dark grey or brownish-black; the wings are very long, and when folded reach almost to the tip of the tail; the eyes are brown, the legs a bright yellow; the toes long, and armed with long, sharp claws. It is about 15 inches in length.

The female is of a brown colour, the feathers, especially on the breast, being edged with a lighter shade. It is larger than the male measuring from 17 inches to 18 inches.

I saw this bird in the Kirin forest north of I-mien-p'o flying round some high, rocky peaks, when winter had practically set in. La Touche records it as a migrant at Chin-wang Tao. It appears to be one of those species that are both migratory and residential.

109. Eastern Hobby.

Falco subbuteo jakutensis (Buturlin).

Hypotriorchus subbuteo jakutensis, Buturlin, Nascha Ochota, June, 4th, 1910, p. 71.

The hobby is in many ways a small edition of the peregrine, while the merlin, our next species, is a miniature hobby. Easily recognizable by its long wings, dark grey, almost black head, back, wings, and tail; white breast, streaked with blackish, and light chestnut coloured leg-feathers and under tail-covert, the hobby is a fierce little bird, of about the size of a pigeon.

Buturlin describes the form inhabiting our region as a subspecies of the European bird under the name *Falco subbuteo jakutensis*, as being very dark above, with larger sopts on the lower parts. His specimen was from the Jakkutsk area; but birds secured by me in the Tung Ling (Hsin-lung Shan) area of North-eastern Chihli, where they were breeding, have been referred to this subspecies.

La Touche records *F. subbuteo* as a migrant at Chin-wang Tao, but I secured specimen in the vicinity of Tientsin as late as November, and I am inclined to think the bird is more residential than migratory.

110. Merlin.

Falco regulus insignis (Clark.)

Æsalon regulus insignis, Clark, Proc. U. S. Nat. Mus., Vol. 32, p. 470, 1907.

This charming though fierce little falcon is common in these parts. It is some two inches shorter than the hobby. The eastern form differs from the European bird in being lighter throughout, and in having the brown streaks of the under parts lighter and narrower. It has the crown, upper parts and tail of a bluish-grey colour, lightly streaked with black; the nape reddish-brown; the throat is white; the under parts light rufous, streaked with dark brown; the tail has a dark band near its distal end, with white tips

to the feathers; the bill is bluish, the cere yellow, as also are the legs and feet. The female is altogether browner, more spotted in appearance, and larger.

It is probably a resident species as well as being to a conciderable extent migratory. I secured specimens in the Tientsin district in December, and a fledgeling at Pei-tai Ho, near Shan-hai Kuan.

111. Eastern Kestrel.

Cerchneis naumanni pekinensis, (Swinhoe).

Falco cerchneis, var. *pekinensis*, Swinhoe, Proc. Zool. Soc. Lond., p. 442 and 448, 1870.

This bird is one of two forms that occur in the Manchurian Region, the other being the Japanese kestrel. It may be distinguished by its grey wing coverts, which in the Japanese form is of the same reddish fawn as the back. It is the commoner of the two forms.

In the male the head is grey; the back reddish-fawn spotted with black; the wing coverts grey; and the tail grey lightly barred towards the tip with black; the breast, belly, and rump are a pale rufous-fawn with dark streaks; the legs, and cere are yellow, the bill bluish, grey, and the eyes brown.

112. Japanese Kestrel.

Cerchneis tinnunculus japonica, (T. and S.)

Falco tinnunculus japonicus, T. and S., Fauna Japonica, Aves. p. 2. 1850.

The Japanese kestrel, which is an eastern subspecies of the common European bird, occurs all over North China, and is probably the form that inhabits Manchuria, though, since true *tinnunculus* has been recorded from China, it is possible that it may also occur in the Manchurian Region. Indeed, Schrenck records *Falco tinnunculus* from the Amur. Ingram also records *tinnunculus*.

The present form may be recognized by the wing-coverts being of the same reddish-fawn as the back; while the blue-grey parts are as in the foregoing, which in other respects it resembles, except that it is a little larger. It has the head greyish, streaked with black; the back and wing reddish fawn, darker than in true *tinnunculus*, and more heavily spotted with black; the tail ashy grey, with a broad black band towards the end, tipped with whitish; underparts buffish, streaked with black.

113. Amur Red-footed Falcon.

Erythropus vespertinus amurensis, (Radde).

Falco vespertinus, var. amurensis, Radde, Reisera-rin Sud von Ost. Sib. II, p. 102, Taf. I, fig. 2, 1863.

This daring little falcon is purely migratory. It is very common in summer throughout North China and the Manchurian Region. I secured a specimen on the Lower Sungari River.

About the size of the sparrow-hawk, it is of a uniformly bluish-grey colour, lighter on the breast than above, and very much lighter on the under wing surface; the feathers of the legs, abdomen and under tail coverts are a bright rufous; the cere, eye-lids, and legs being of an orange-red; the bill blackish-grey.

It differs from the European form, *Erythropus vespertinus*, in having the plumage lighter, and the difference between the upper and lower parts greater.

This bird inhabits the open plains, where it builds a large nest high up in some tall deciduous tree. It frequently nests in large towns. It is a very noisy bird while nesting, continuously uttering its shrill chattering cry as it flies to and fro. Like all the falcons it is a fast flyer and an intrepid hunter.

Schrenck recorded *Falco vespertinus* from the Amur.

Family Buteonidæ.

The family *Buteonidæ* contains the eagles, buzzards, harriers, goshawks, sparrow-hawks, kites and honey-buzzards, all of which are distinguishable from the falcons by their shorter, more rounded wings, and usually longer legs, and comparatively shorter toes. Not only so, but as a class they lack the speed on the wing, the daring, and ferocity of the falcons.

114. Eastern Golden Eagle.

Aquila chrysaëtos daphanea, Menzbier.

Aquila daphanea, Menzbier, Orn. Tukestan, I, 1888, p. 75, also in Gray's Zool. Misc. p. 81, 1844. (Nomen nudum).

The golden eagle of these parts seems to be a somewhat larger and brighter coloured form of the European bird, of which it is a subspecies. It may be recognized by its large size; dark brown colour, lighter on the head and nape; white basal portions of the secondary wing and tail feathers. The beak is black, the cere yellow, as also are the legs and feet; the eyes are brown.

I saw what I took to be one of these birds on the Lower Sungari. It is probably more common in the mountainous regions, and on the Mongolian border. It is very common in the mountains of North China, where it breeds.

115. Spotted Eagle.

Aquila maculata (Gmelin).

Falco maculatus, Gmelin, Syst. Nat., I, p. 258, 1788.

The spotted eagle, which is fairly common in North China and Mongolia, occurs also in Manchuria, though much more rarely. Pallas described it under the name *Aquila clanga**; while Schrenck recorded it under the name *A. naevia*, Briss. from the Amur region.

A smaller bird than the golden eagle, it may further be distinguished by its plumage, which is darker, has no white on the wings or tail, and is spotted on the upper parts, and streaked on the breast with light buff-brown in the immature birds. In adults the spots and streaks disappear. Length, 29 inches.

I saw one of these birds in the forest region near I-mien-po, North Kirin, where it was hanging round a swampy clearing.

To a large extent migratory, it is certainly also residential, some individuals remaining in the Manchurian Region for the winter. It breeds in Mongolia, where I saw large numbers throughout the southern grass-lands in the summer of 1912.

116. Eastern Steppe Eagle.

Aquila nipalensis nipalensis (Hodgson).

Circaëtus nipalensis, Hodgson, Asiatic. Res. XVIII, part 2, pl. 1, pp. 13-16, 1833.

This eagle is a little larger than the spotted eagle. It has the head brown; back of neck fulvous; wings and tail blackish brown, the latter tipped with fulvous, and having obscure ashy bars; the edge of the wing is white, forming a conspicuous white shoulder. Its total length is 30 inches.

It occupies Mongolia, and probably ranges at least into Western Manchuria, being known also from North China. Westward its range extends into Thibet and neighbouring regions.

* Zoogr. Ross.-Asiat., p. 351, 1811-31.

The Spotted Eagle (*Aquila maculata*, Gm.) captured by native hawk catchers at Chin-wang Tao, N. E. Chihli.

The White-tailed Sea Eagle (*Haliaetus albicilla*, L.) captured at Chin-wang Tao, N. E. Chihli.

The White-headed Buzzard, captured at Chin-wang Tao.

Photos by J. D. de La Touche.

117. Japanese Hawk Eagle.

Spizaëtus nipalensis orientalis, T. and S.

Spizaëtus orientalis, T. and S., Faun. Jap., Aves, p. 7, pl. III, 1844-1845.

This is one of the crested eagles. Its wings, as compared with the tail, are short, while the legs are feathered down to the toes. The upper parts are dark brown, or black, with the back and sides of the neck bright rufous; the tail is brown with four or five black bands; the under parts are whitish, barred on the tarsus, flanks, and the hinder parts with dusky. Length, 28 inches.

It probably occurs in the Manchurian Region as a migrant.

118. Bonelli's Hawk Eagle.

Hieroaëtus fasciatus fasciatus, (Vieillot).

Aquila fasciata, Vieillot, Mém., Soc. Linn., Paris, II, 2, 1822, p. 152.

The well known Bonelli's hawk eagle is the largest of the hawk eagles. It is dark brown on the wings and upper parts, white below, with dark shaft-streaks; there are some whitish feathers on the head and face; the tail is greyish-brown barred with brown towards the tip; the eyes, cere and feet are yellow; the bill black; the legs feathered down to the feet.

It probably occurs in the Manchurian Region, as it is known to inhabit Eastern Asia.

119. White-headed Buzzard.

Buteo ferox hemilasius, T. and S.

Buteo hemilasius, T. and S., Fauna Japonica, Aves, p. 18, pl. 7, 1850.

The white-headed buzzard is a large, and comparatively fierce bird, that occurs throughout North China, Inner Mongolia and the plains of Western and Southern Manchuria. It is distinguishable by its light brown colour, white or partially white head, and whitish tail. There is also a good deal of white or light buff on the wings. The cere, eyes, legs and feet are light yellow.

Though a fierce and keen hunter its flight is not fast enough to make of it so formidable a foe as the gerfalcon or even the peregrine. I once witnessed one of the latter birds chasing a buzzard

that had captured a partridge, and in the end it made the larger bird drop its prey. The buzzard's chief prey consists of hares, susliks, gerbils, and other rodents that live on the plains.

This bird builds its nest high up on the face of some cliff where it can find a suitable ledge, projecting tree or bush.

It is non-migratory.

120. Japanese Buzzard.

Buteo buteo japonicus (T. and S.)

Falco buteo japonicus, T. and S., Fauna Japonica, Aves, p. 16, pl. 6, 1850.

Ingram records this bird from the Khingan Mountains during the breeding season under the name of *Buteo vulgaris plumipes*. It has also been recorded from Eastern Siberia where it was found by Middendorff and Dybowski.

It differs from the European buzzard in having the metatarsus feathered to a greater extent; and from the foregoing in being of a darker brown, with little or none of the white, and also in being somewhat smaller.

121. Eastern Rough-legged Buzzard.

Archibuteo lagopus pallidus, Menzbier.

Archibuteo pallidus, Menzbier, Orn. Turkestan, I, 1888, p. 163.

The rough-legged buzzard differs from the foregoing in having the feathers of the leg extending right down to the feet. The present is a pale eastern form of the European rough-legged buzzard.

In North China a closely related form, the Himalayan rough-legged buzzard (*A. strophiatus*), occurs.

122. Striped Harrier.

Circus spilonotus, Kaup.

Circus spilonotus, Kaup, Jard. Contr. Orn., p. 59, 1850.

This bird is an Asiatic form of the marsh harrier, and is fairly common in East China and Western and Southern Manchuria.

It is blackish-brown above, streaked with white on the head and back; the underparts are white heavily streaked with blackish-brown on the throat and breast.

La Touche records (*Ibis*, 1920, p. 916) the common marsh harrier, *Circus æruginosus* (L.), as extremely abundant during September in the Chin-wang Tao district.

123. Hen Harrier.

Circus cyanus cyanus (L.)

Falco cyanus, L., Syst. Nat. I, p. 126, 1766.

The commonest harrier of the marshes and flat lands of our region is the hen harrier.

The male is of a light bluish-grey above, and on the throat and chest; the breast and belly are white; the primaries dark dusky. The female is brown, with white or buff about the head, the rest of the plumage having a speckled appearance, due to the fact that the feathers are darker in the centres than on the edges.

When the marshes freeze up in the winter many of these birds migrate. Others betake themselves to the mountainous and wooded areas, where they may still find a living by preying upon small birds and rodents.

124. Pied Harrier.

Circus melanoleucus (Forster).

Falco melanoleucus, Forster, Ind. Zool. p. 12, pl. 11, 1781.

The pied harrier, with its black head, throat, chest, back, and tail, its black and white wings, and white breast, and lower parts is a very conspicuous bird. It was one of the commonest of the hawks that I saw while travelling in Fengtien in May. Ingram records it from the Khingan Mountains during the breeding season.

I have frequently seen it in North China, notably in the Tung Ling, in the dead of winter.

125. Goshawk.

Astur gentilis schvedowi, Menzbier.

Astur palumbarius schvedowi, Menzbier, Mém. Sc. Univ. Imp. Moscou. Hist. Nat., 1882, p. 439.

The goshawk is a favourite bird with Chinese and Manchu falconers, and one may frequently see fine specimens being carried about by sportsmen in the streets of the large cities and towns. The bird is used successfully in the chase of the hare, and also of partridges and even pheasants.

It may be recognized by its uniform dusky grey colour above, light breast closely barred with dusky, long, yellow legs, bright yellow eyes, yellow cere and horn coloured bill. The wings, when folded reach but little beyond the base of the tail. The latter is

barred with a darker dusky. In size it exceeds the peregrine, the female almost equalling the buzzard. This form is purer grey than true *gentilis*. The immature bird is brown above, pale below, with the breast streaked instead of barred. The female is considerably larger than the male.

Ingram records *A. palumbarius* as secured by James in 1886, but it is probable that the form occupying these parts is referrable to Menzbier's subspecies.

Schrenck also used the name *palumbarius* in recording the bird from the Amur.

It is interesting to note that there is a so-called 'white' race described from Kamschatka, under the name *A. g. candidissimus*, Dybowski.

126. Eastern Sparrow-Hawk.

Accipiter nisus nisosimilis (Tickell.)

Falco nisosimilis, Tickell, Journ. Asiat. Soc. Bengal, II, 1833, p. 571.

With but slight variations in the plumage the sparrow-hawk looks like a miniature goshawk. It has the same uniform upper parts, though of a darker, greyer colour, and the breast barred in much the same way, though the male has it a light chestnut colour, the female being light greysh white; the tail is long and barred as in the goshawk, the wings short, and the legs long.

Though ready enough to feed upon grasshoppers and other insects, the sparrow-hawk is, nevertheless, capable of attacking and killing quite large birds. It commits terrible depredations amongst the smaller passerines, especially during the migrations, though in this respect it is not so bad as the hobby, merlin and kestrel.

The above subspecies is the form that occupies North China and probably Western and South-western Manchuria, though Giglioli and Solvadori record what is probably this bird under the name of *Accipiter nisoides*, Blyth, from Olga Bay, on the East Manchurian, or Primorsk Coast. Ingram records *A. nisus* from the Khingan Mountains.

127. Japanese Sparrow-Hawk.

Accipiter gularis, (T. and S.)

Astur gularis, T. and S. Faun. Jap., Aves, p. 5, pu. 2, 1850.

It is evident that this species occurs in the Manchurian Region, probably as a migrant, for Ingram records it as breeding in the Khingan Mountanis, where, he says, the young were seen on May 23rd.

It differs from the foregoing in having a smaller wing, and in the throat being white with only one row of feathers in the centre with dark shaft-streaks, instead of all the feathers being so marked.

128. Black-eared Kite.

Milvus lineatus (Gray).

Haliaetus lineatus, Gray, Hardwicke's Ill. Ind. Zool. I, p. 1, pl. 18, 1832.

Milvus melanotis, T. and S., Fauna Japonica, Aves. p. 14, pl. 5, 1850.

The common kite of these parts is the so called, black-eared kite. It differs from the European form in being considerably darker. It may readily be distinguished from other birds-of-prey of about the same size by its untidy appearance and slightly forked tail. It has bluish feet instead of the yellow usual amongst the falcons and buzzards. In size it about equals the white-headed buzzard, (*Buteo ferox hemilasius*). It is extremely common.

This form is generally known under the name of *Milvus melanotis*, T. and S., but it should he *M. lineatus*, Gray's name being a much earlier one.

Schrenck records *M. melanotis*.

129. White-tailed Sea Eagle.

Haliæetus albicilla, (L).

Vultur albicilla, L., Syst. Nat., I, p. 123, 1766.

The white-tailed sea eagle occurs in the Manchurian Region along the great rivers during the warmer months, retiring to the sea when winter comes on.

It may be distinguished at once by its light brown plumage, white tail and large yellow bill.

Taczanowski records it from Corea. Schrenck records it from the Amur.

130. Steller's Sea Eagle.

Thallasoaëtus pelagicus, (Pallas).

Aquila pelagicus, Pallas, Zoogr. I, p. 343, pl. 18, 1811.

This gigantic bird is the largest of the eagles, and is of comparatively rare occurrence. It may be recognized by its pure white wing-coverts, thighs and upper and lower tail-coverts. The rest of the bird is of a dark brown almost black colour, the head being a lighter shade, sometimes almost white.

This eagle breeds in the region of the Sea of Okhotsk, where alone it has ever been seen in any numbers.

Schrenck recorded this bird from the Amur.

131. Black Sea Eagle.

Thallasoaëtus niger (Heude).

Haliœetus niger, Heude, La Naturaliste, 1887, p. 96 (2).

Haliœetus branchii, Taczanowski, *Proc. Zool. Soc. Lond. Nov.* 20, 1888, pp. 451-453.

From Taczanowski's description and figure there can be little doubt that his *Haliœetus branchii* from Corea is the same as Heude's earlier *H. niger*.

This sea eagle is larger than the white-tailed sea eagle, but not so large as Steller's form. It may be distinguished by its almost black plumage, white tail, and its very thick, heavy yellow bill. Heude in 1898 published further notes on this eagle, and also a good coloured illustration in Volume II of his "Mémoires Concernant l'Histoire Naturelle de l'Empire Chinois," in which he refers to Taczanowski's name as though it represented a distinct form. This is hardly likely to be the case, and for the present it is advisable to retain but the one name. The black sea eagle appears to be very rare, and few specimens have been taken. It probably occurs at least along the Primorsk Coast.

132. Eastern Honey-Buzzard.

Pernis apivorus orientalis, Taczanowski.

Pernis apivorus orientalis, Taczanowski, Faune Orn. Sib. Orient: Mém. Ac. Imp. Sci. St. Péters., Ser. 7, Vol. XXXIX, p. 50, 1891.

The honey-buzzards are distinguishable from other birds of the family by their rather short and less hooked bills, and short claws. They owe their name to the fact that they live to a certain extent upon bees and wild honey. They are rather rare birds.

Taczanowski has described a subspecies as distinct from that occurring in China, which is known as *P. ellioti*, Jameson. Our form differs from true *apivorus* in being of a generally brighter or more intense colour, and in having longer toes.

133. Grey-cheeked Brigand Eagle.

Butastur indicus, (Gmelin.)

Falco indicus, Gmelin, Syst. Nat. I, p. 264, 1788.

This bird, which in many ways has the appearance of a harrier, is of a dark brown on all the upper parts, with slightly lighter breast, belly, and legs, which are barred with white; the throat is white with a dark stripe down the middle; the cheeks are greyish; the bill black; cere and legs yellow, the tarsus being bare.

Family Vulturidæ.

Members of this family are very rare in these parts, not only in the numbers of individuals, but also in the number of species. Only one can be said to belong to the Manchurian Region, namely the black vulture, though it is just possible that the lammergier, which I have seen in the mountains of North China, may extend into the extreme south-west.

134. Black Vulture.

Ægypius monachus, (L.)

Vultur monachus, L. Syst. Nat., I, p. 122, 1766.

The black vulture, whose range extends from Spain across Southern Europe, and Central Asia at least into Western Manchuria, is the largest of the *Accipetres* in these parts. A specimen that was taken in Shansi I found to measure 9 feet across the wings.

This bird is of a uniform pure black (brownish in immature specimens), with a naked neck of a pale bluish colour, the head being covered with soft, black down, which assumes the form of a tuft on the back of the crown. There is a ruff of long feathers below the naked part of the neck. The bill is large, strong, and black; the eyes are brown; the feet, which are rather weak as compared with those of the eagles, and have short, straight claws, are of a dull crimson colour. The tail is wedge-shaped.

The bird inhabits only mountainous country, and is far from common.

CHAPTER III.

The Game-Birds of Manchuria.

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We now have to deal with a series of birds, that, to many of my readers, are of more interest than all the others put together, with the exception, perhaps, of the wild-fowl. I refer to the game-birds, and in using that term I am adhering more to its strict British sense, which includes only gallinaceous birds and one or two other sporting species, and not the wider American sense which includes all the wild-fowl and the shore-birds as well. For the sake of convenience, however, I am including the members of the dove family in this chapter, and trust that the fastidious sportsman will pardon me this digression from the paths of correct nomenclature.

Taken as a whole the true game-birds are, more than any others, permanent residents of the country in which they live. The same may be said of most of the *Columbidæ*, though some of these are partial migrants. One form dealt with here, the Chinese ruddy ring-dove (*Œnopopelia tranquebarica humilis*), is purely migratory as regards the Manchurian Region. The bustard (*Otis dybowskii*), which may truly come under the heading of game birds, though a migrant in the truest sense, is to be found in different parts of the region at different seasons.

Compared with China, Manchuria cannot lay claim to a great variety of game-birds, nor, since the depredations committed by the exporters of game in cold storage, can she boast a great quantity of feathered game at all, except in the more remote and inaccessible areas. Certain areas in Fengtien and Kirin, which only a few years ago swarmed with pheasants and partridges, have been absolutely depleted of these birds.

A correspondent writing from Newchwang to me on the subject, made the statement that a poultry dealer of his acquaintance had told him that the various firms engaged in the business at Ch'ang Ch'un exported 800,000 pheasants that season, (winter of 1913-14). A European actually engaged in buying game from local hunters

said that the game exported in the 1913-14 season from the Harbin districts amounted to 200,000 pheasants and 10,000 to 15,000 hazel-grouse and partridges. Small wonder then that these birds have become so scarce in these areas during the last few years.

I repeat here what I have said elsewhere, that unless rigid game laws are introduced and enforced at once, this country, which at one time formed so magnificent a game reserve, will soon be robbed of all its valuable birds and animals, exactly as has been that one time sportsman's paradise, the lower Yang-tzu Valley, by those who think only of the profits accruing from the wholesale exportation of game. In most places the mischief has been done; but there still remain areas well worth preservation, if it can only be brought home to the minds of those who have the framing of the country's laws, what a valuable national asset the game-birds and animals are.

Including the doves, pigeons, and bustard, we have some twenty three species and subspecies to deal with here, representing the families *Phasianidæ*, *Turnicidæ*, *Tetraonidæ*, *Pterocletidæ*, *Columbidæ* and *Otididæ*, or the pheasants, partridges and quails the button quails, the true grouse, the sand-grouse, the doves and pigeons, and the bustard, respectively.

Family Phasianidæ (Pheasants, Partridges, and Quails).

The *Phasianidæ* are a well known family of gallinaceous birds, which is represented in our region by the ring-necked pheasants, the koklas, or pucras pheasant, the chukar, or red-legged partridge, the bearded partridge, and the Japanese quail. About all these, but more especially about the pheasants, there exists a good deal of confusion as regards the true status of the names employed to distinguish them, as well as regards the number of forms that actually occur in our region, and before a proper understanding of the subject can be arrived at, it is necessary to clear up, if possible, a number of doubtful points.

For instance Buturlin, to whom we owe a good deal of splitting up of species into somewhat doubtful subspecies, has described, in addition to his *Phasianus kiangsuensis*, about which more later, some three forms belonging to this genus from Manchuria, at the same time rejecting Rothschild's *P. pallasi* as invalid. These are *P. karpowi* from the south, *P. alpherakyi* from the north, and *P. alpherakyi ussuriensis* from the Ussuri Valley, and, presumably,

eastward in the Primorsk. In addition to these Clark has described the Corean pheasant as *P. karpowi buturlini*, a subspecies of the South Manchurian bird.

Again, Poljakow has split off the partridge of the Ussuri region from the more westerly *Perdix daurica*, as a subspecies *P. d. suschinki;* while Bogdanow has done the same with the quails from the Ussuri, naming the form *Coturnix ussuriensis*.

Let us consider first the pheasants. For some considerable time Buturlin's *kiangsuensis* has been a serious stumbling block in the path of ornithologists in their attempts to understand the status of the pheasants of Eastern China generally. As a matter of fact it is a complete misnomer. In the first place the species was described on a bird bought by Radde in 1856 at Kiakta in Outer Mongolia (*i.e.* Northern Mongolia) in a frozen condition, and which Buturlin supposes to have been brought from Kalgan in North Chihli on the Sino-Mongolian frontier. As pheasants are actually taken from Kalgan to Kiakta in a frozen state, even to this day, he may have been right in supposing that North Chihli was the origin of Radde's specimen, but where he is entirely wrong is in supposing that the same form extends through Eastern China to the Lower Yang-tzu and Kiangsu Province. It was on the strength of his description of Radde's specimen being said to fit birds from Shanghai (which is in Kiangsu), that he applied the name *kiangsuensis*.*

As a matter of fact the Kiangsu and Lower Yang-tzu birds cannot be separated from *P. torquatus*, which was originally described from South-eastern China, and to which birds from these regions were always assigned before the introduction of Buturlin's name in 1904.

After a careful examination of birds in the British Museum and elsewhere, one is forced to the conclusion that the name *kiangsuensis* may be valid for the pheasants that occupy North-western Chihli, North Shansi, and North Shensi, as specimens from these areas answer the description. North-eastern Chihli, and southward as far, at least, as the Yellow River is occupied by Buturlin's *P. karpowi*, whose range is thus extended from Southern Manchuria, and meets, and probably mixes with, that of *kiangsuensis* somewhere in Central and Northern Chihli.

* *Phasianus holderii kiangsuensis*, Buturlin, Ibis, 1904, pp. 407 and 408.

Rothschild's *pallasi*, which Buturlin tried to suppress on totally illegitimate grounds, substituting his *alpherakyi**, extends from Siberia into Northern Manchuria, occupying the Amur basin, Northern Kirin and probably the Ussuri Valley and Primorsk as well. If Buturlin's subspecies *ussuriensis* is a genuine one, then its name should be *P. pallasi ussuriensis*, since *alpherakyi* cannot be considered as anything but a synonym of *pallasi*.

That *karpowi* is a good species is clear, and there is no reason to doubt its Corean subspecies *buturlini;* but just where the ranges of these two forms meet it is difficult to decide, though it is well within the range of possibility that the latter occupies the Yalu Valley at least.

We may thus conclude that the following two species occur in the Manchurian Region:

Phasianus pallasi, Rothschild, occupying the north,

Phasianus karpowi, Buturlin, occupying the south,

with a possibility of *P. pallasi ussuriensis*, Buturlin, occupying the Ussuri and Primorsk, and *P. karpowi buturlini* Clark, occupying the Yalu basin.

As regards the partridges, it would appear that Poljakow is justified in separating the Ussuri form, and, it should be added, the form that inhabits the greater part of Manchuria, from the more westerly form, for after an examination of a large number of specimens from all parts, one is lead to the conclusion that the Manchurian birds are distinctly darker, and greyer, as will be described later, than those from Mongolia. However, both forms occur actually in Manchuria so we must include them in our list.

The case of the quails is not so easily settled, owing to the facts that these birds are migratory and also show very marked seasonal changes in their plumage, which has led to the inclusion of the common or migratory quail (*Coturnix coturnix*, L.) in the list of East China and Manchurian birds by some authorities, and to the describing of a distinct subspecies from the Ussuri Region. My examination of a large series of specimens from these parts, including the Ussuri and Amur, leads me to the conclusion that but one form occurs throughout the whole region, namely the Japanese quail (*Coturnix japonica*, T. and S.), in which I conform to the view adopted by Hartert and Rothschild.

* Ibis, 1904, pp. 300 and 403.

135. North Manchurian Pheasant.

Phasianus pallasi, Rothschild.

Phasianus pallasi, Rothschild, Bull. Brit. Orn. Club, Vol. XIII, p. 43, 1903.

In considering this and the following form as full species of the genus *Phasianus* I am fully aware that such eminent ornithologists as Rothschild and Hartert have recently placed all these eastern pheasants within the species of *colchicus*, considering them to be only of subspecific rank. I prefer, however, to cling to the older usage, for, though I might be prepared to admit that the various forms of Chinese pheasants, speaking, of course, of the ring-necked pheasant and its relatives, are only subspecifically different from each other, I find it quite impossible to agree that, say, *P. torquatus* and *P. colchicus* bear the same close relationship to each other. This, however, is a matter that must be fought out and settled elsewhere than in a book of this nature, it being sufficient here to indicate my reason for adopting the course I have.

Pheasants occur throughout the whole of Manchuria, and at one time were extraordinarily abundant. As already shown the species that inhabits the northern areas is Rothschild's *P. pallasi*, whose range extends from Siberia into our region in the Amur, Northern Kirin and probably eastward to the Japanese Sea.

It is a pale bird with a broad white collar. Buturlin describes it under the name *alpherakyi* as follows: "Wing-coverts ashy-grey; crown and nape somewhat lighter (than in his *kiangsuensis*), slightly more sandy yellow; mantle rather paler, more *straw* yellow; rump somewhat greyer." This is very well exemplified in a specimen in the British Museum collection from Blagoveschensk, which, compared with a specimen of *kiangsuensis* from Tai-yuan Fu, Shansi, shows very much more conspicuous white and sandy eyebrows, and lighter crown and nape.

The description also fits true Siberian birds.

Buturlin describes his subspecies *ussuriensis*,* from the Ussuri region as follows. "Wing-coverts creamy or sandy-grey; crown and nape somewhat darker (than in his *alpherakyi*), a little more rusty brown; mantle slightly brighter, more *golden* yellowish; rump somewhat more olive." Unfortunately for the validity of

* *Phasianus alpherakyi ussuriensis*, Buturlin, Ibis, 1904, pp. 403-405.

this subspecies, this description fits a bird in the British Museum collection from the Amur region. Thus one is not prepared to accept it as a genuinely distinct form till sufficient evidence is produced to show that it actually occupies an area distinct from that occupied by true *pallasi*.

136. South Manchurian Pheasant.

Phasianus karpowi, Buturlin.

Phasianus harpowi, Buturlin, Orn. Monat., Vol. XII, p. 3, 1904.

This species from South Manchuria appears to have been named after Captain Karpow, who did some collecting in the region round Newchwang (Ying-k'ou), at the mouth of the Liao. It was described as follows:

"General colour very dark; mantle and flanks intense golden-orange; scapular margins dark maroon, or chocolate-rufous; crown more rusty brown (than in *pallasi*); superciliaries narrower and partly chestnut-stained; front and sides of neck more purplish blue; wing-coverts sandy or creamy grey; rump not much mottled." This description says nothing about the species' relationship with Chinese birds, but from it may be gathered that the flanks are slightly darker than *kiangsuensis*, and therefore *torquatus*, in both of which it is very light. In the latter also the sheen on the sides of the neck is green.

Clark's subspecies *buturlini** from Corea was described as having the mantle and flanks paler; rump more greyish; tail more olive and less yellow, and less heavily barred toward the tip; and the superciliary stripe broader and more conspicuous, beginning on the fore part of the crown, and extending to the nape.

Though prevalent everywhere in the Manchurian Region, these ring-necked pheasants seem to be most plentiful, and to thrive best, in the low-lying areas that are not too damp, where hills, covered with low scrub, adjoin cultivated fields. This assures them shelter and food, and, of course, where man has settled the wild beasts that prey upon the pheasants are not nearly so plentiful, as in wilder parts.

* Proc. U. S. Nat. Mus., Vol. 32, 1907, p. 468.

The South Manchurian pheasant (*Phasianus karpowi*, But.) from the Chinese-Manchurian border.

The Amur Hazel-grouse (*Tetrastes bonasia amurensis*, Riley), shot in the I-mien-po district, N. Kirin.

137. North China Pucras Pheasant, or Koklas.

Pucrasia xanthospila, Gray.

Pucrasia xanthospila, Gray, Proc. Zool. Soc. Lond., 1864, p. 259, pl. 20.

The handsome pucras pheasant is one of the finest of the game-birds that occur in these regions, though, owing to the inaccessibility of its haunts, and the difficulty entailed in shooting it, it cannot be considered as a favourite amongst sportsmen. Its home is on the mountain top, where cliffs and jagged rock occur, and where pine and spruce afford it the food that it loves. Its Chinese name is *Sung-chi*, which means "pine fowl", indicating thereby the fact that it frequents only country where pines are plentiful, and that it feeds upon the seeds of these and other conifers, which it extracts from the cones by means of its powerful strongly curved bill. Its colouring, though handsome enough, and in a way conspicuous, nevertheless blends so perfectly with the rocky surroundings, that it is almost impossible for the human eye to detect it when keeping still, and the sportsman is seldom aware of its proximity till, with a terrific whirr of wings, it breaks cover, and speeds away along the cliff or out amongst the pines, dodging and turning in a most bewildering way.

As far as I am aware this bird occurs in Manchuria only in the extreme south-west, where the North-east Chihli mountains extend into Fengtien Province, and even so it is probably not at all common. I found it fairly common in the Tung Ling area, north-east of Peking.

The bird is characterized by a long crest, a thick, heavy bill and wedge-shaped tail of no great length. The top of the crest and nape are of a light chestnut brown; the rest of the chest, face, cheeks, throat and back of the head are black with a fine green sheen; two white patches occur on the sides of the neck; a deep chocolate colour extends in a band down the front of the neck, chest, and belly to the base of the under tail-covert, which is of the same colour covered with white pear-shaped dots; the rest of the plumage on the neck, back, breast, flanks and legs is grey, streaked with black; the wings are dark brown, streaked with black; the wedge-shaped tail has the two middle feathers, and

several long feathers of the upper tail-covert brown with a grey streak down the middle; while the outer feathers are grey with a black bar near the tip, and a white tip; the bill is black; legs grey, each armed with a small spur. The female is grey-brown streaked with blackish.

The bird is larger than the common pheasant, weighing about half a pound more.

138. Bearded Partridge.

Perdix daurica, (Pallas).

Tetrao perdix, var. *daurica*, Pallas, Zoogr. Ross.-As., ii, p. 78, 1811.

The bearded partridge (*Perdix daurica*, Pall.) undoubtedly occurs in the Manchurian Region in the west and south of Manchuria Proper, though a subspecies *P. d. suschkini*, Poliakow, has been described from the eastern areas.

The bearded partridge occurs all over North China and in Mongolia, and it may be recognized at once by the deep buff or sandy colour of its throat and neck, and by the tuft of long feathers on the throat. The middle of the lower breast and belly are occupied by a broad black patch, never brown; while the feathers of the upper parts are distinctly more brownish than in the European bird, with which, however, it agrees in size and habits.

Ingram records this bird from North-western Manchuria.

139. Ussurian Partridge.

Perdix daurica suschkini, Poliakow.

Perdix daurica suschkini, Poliakow, Zur Ornith. Faun. Ussuri-Gebietes, in Mess. Orn. Vol. VI, p. 38, 1915.

As already stated the Ussurian partridge has been described as a separate subspecies of the foregoing bearded partridge. It appears to be a very close relation of the bearded partridge, differing in that the grey vermiculated parts of the upper back, neck and chest are very much more of an ashy grey, the mantle being scarcely barred at all with brown as it is in true *daurica*. The rest of the plumage also shows less inclination to sandy or buff, parts of the throat, forehead, cheeks, neck, and breast are more intense. This grey form extends into Siberia.

140. Chukar, or Red-legged Partridge.

Caccabis chukar pubescens, Swinhoe.

Caccabis chukar, var. *pubescens*, Swinhoe, Proc. Zool. Soc. Lond., 1871, p. 400.

The chukar, which is very common all over North China, wherever there are mountains, or high hills, occurs in Manchuria in the west and south, but not in the centre, east or north.

The crown, nape, back, wings, and upper tail covert are of a general dove-grey mixed with light brown, being more of an ashy-grey on the forehead, pinkish on the mantle, and brownish-grey on the wings and tail; the centres of the feathers on the shoulders are occupied by a light steel-blue, which shows as a few spots on that part of the body; the throat and gorget are a deep buff, edged with a broad band of black, passing through the eye above the bill; the feathers on the chin and corners of the mouth are black; the chest, and upper breast are ashy-grey, washed with mauve-grey; the lower breast, belly and under tail-covert are a very deep buff; the flanks are barred, buff, black, and chestnut occurring in alternate bands, with an occasional steel-blue wash on the buff; the ear-coverts are a rich chestnut; excepting the four central ones, which are of the same colour as the upper tail-covert, the tail-feathers are ashy-grey at the base and chestnut red on the distal half; the eyes are brown; the bill and legs carmine or crimson.

The bird is about the size of the French partridge, which in many ways it resembles.

141. Japanese Quail.

Coturnix japonica, T. & S.

Coturnix vulgaris, var. *japonica*, T. & S., Fauna Japonica, Aves, p. 103, pl. 61, 1850.

As already indicated, there seems to be sufficient reason to conclude that our region is occupied by but one form of true quail, though the common or migratory quail (*Coturnix coturnix*, L.) has been recorded there, while a separate subspecies (*C. japonica ussuriensis*, Bogdanow)* has been described from the Ussuri.

The Japanese quail differs from the common quail in being somewhat smaller; in having more rich chestnut-brown on the back

* Consp. Av. Imp. Ross., I, p. 45, 1884.

and mantle; the chest, breast, and flanks more chestnut; the chin, throat, and cheeks, instead of buff-white, of a peculiar dull chestnut-chocolate in the male, white or buffy in the female. The female may be distinguished from the common quail in having the breast and flanks more spotted. The chestnut-chocolate of the throat, and cheeks frequently has a rather broad, irregular black streak down the middle; and in winter either becomes streaked and spotted with buffy-white, or else altogether buffy-white. In summer the whole plumage becomes darker, and black greatly predominates in the upper parts. As the bird is migratory as far as Central and Northern Manchuria are concerned, it is in this dark plumage that it appears in the Ussuri. The species occurs throughout the winter in South Manchuria.

I secured specimens on the Lower Sungari near its junction with the Amur in July and August. Ingram records this bird, as also do other authorities, from these regions.

Family TURNICIDÆ.

The button quails (*Turnix*) differ from the true quails in having only three toes, the fourth, or hind toe being absent, and also in having longer, more slender bills. But one species occurs in North China and Manchuria, and it is a migrant.

142. BUTTON QUAIL.

Turnix blanfordi, Blyth.

Turnix blanfordi, Blyth, Journ. Asiat. Soc. Beng., XXXII, 1863, p. 80.

This interesting little bird is only a summer visitor in the Manchurian Region, where, apparently, it breeds. I secured a specimen on the banks of the Sungari River, near its junction with the Amur, in July.

About the size of the Japanese quail, or perhaps a little smaller, this little bird has very much the external appearance of the true quails; but a closer examination reveals the fact that it has a much longer bill, more like that of the rails; while there are only three toes, which fact seems to connect it with the bustards. Its wings are larger than in the quails, and the plumage is marked with large round dots generally of a black colour. The female, strangely enough, is larger and more handsomely marked than the male.

The plumage is of a general dark greyish brown above, with a sprinkling of chestnut on the shoulders and mantle; there is a light streak over each eye, and one down the middle of the crown; the lower parts are of a light yellowish buff, increasing in richness to a chestnut-buff on the chest; the chin is almost white; the legs are longer than in the true quails, and of a yellow colour; the eyes are a pale lemon yellow; the bill horn-brown above, yellowish beneath. The male is paler and more inclined to light chestnut-buff on the upper parts.

The habits of this little bird are very similar to those of the true quails, though it seems to be more solitary. It frequents low-lying districts, where it lies very close.

Family Tetraonidæ.

The grouse family is represented in the Manchurian Region by a number of species and subspecies, of which the hazel grouse is by far the most common. The members of this family are easily recognized by their feathered legs, sometimes the toes also being feathered. They constitute an important group of game-birds, which is wanting in the East China avi-faunal sub-region, and only very poorly represented in the extreme west of China. As a group they are birds that belong to northern climes, and where they do occur further south generally occupy high altitudes.

143. Amur Hazel-Grouse.

Tetrastes bonasia amurensis, Riley.

Tetrastes bonasia amurensis, Riley, Proc. Biol. Soc. Wash., Vol. XXIX, pp. 17 and 18, Jan. 25, 1916.

The hazel-grouse which occurs in the forested areas of the Manchurian Region has been described by Mr. Riley as a distinct subspecies of *Tetrastes bonasia* from specimens collected by me in the I-mien-p'o district of North Kirin. He named it *T. b. amurensis*.

This bird is the commonest game-bird in the forested areas, where it may always be found in places where pines, spruce, or oak are plentiful, except, of course, in places where it has been exterminated to satisfy the greed of the cold-storage exporters of game, poultry, and meat.

I came across the hazel-grouse, or, as it is often known, the hazel-hen, first in the Yu-shu-ch'a district. south-east of Chiao-yang Chên on the Fengtien-Kirin border, where, however, I failed to secure a good specimen. The only one obtained by my hunter was so damaged as to be beyond preservation. It was not till I got into the forests of North Kirin that I secured any good specimens.

As a genus the hazel-grouse are distributed all over Northern Europe, throughout Siberia, down into Western China, and into Manchuria, North Japan (Yeso), at least, and Kamschatka. Its place is taken in North America, by the ruffed-grouse, or 'partridge,' (*Bonasa umbellus*), a closely related form.

Besides the common form *T. b. bonasia*, which occurs from Scandinavia into Siberia, there are *T. b. griseiventris* from Perm in East Russia, *T. b. severtzowi* from North-eastern Thibet and West China, Seebohm's *T. b. septentrionalis* from Northern Siberia, and Riley's two forms *T. b. amurensis*, from the Manchurian Region, and *T. b. vicinitas** from Yeso, or Hakkodati.

In describing *amurensis* Mr. Riley says it "differs from *Tetrastes bonasia bonasia* in having less white over the incipient ruff; in being grayer above (than in the gray phase) with a mere trace of deep hazel in the interscapular region; and in having the underparts more heavily marked and with a deeper shade of brown or black. . . . From *Tetrastes bonasia septentrionalis* it is so very distinct that it hardly needs comparison; that form is clear neutral gray above, lighter on the rump, with the black barring rather narrow on the interscapular region and with only the scapulars showing brown (hazel), while in the present form the back is hair brown with deep hazel bars and the black bars a little broader but not so numerous. The wings in *T. b. septentrionalis* are also very different from *T. b. amurensis*, the former contain more white and the edgings to the feathers are broader."

Mr. Riley's description of our bird is too long to quote here. Roughly the bird may be described as having the upper parts grey-brown barred with brown and black; there is a white band extending from the middle of the chest obliquely over the shoulder; the throat and gorget are black lined with white; the breast is white closely barred with black; the flanks and under tail-covert a rich

* *Proc. Biol. Soc. Wash. Vol. XXVIII*, pp. 161-164, Sept. 21, 1915.

chestnut; and the tail has the two central feathers a motted brown, the other fourteen mottled grey barred with black towards the end, and tipped with white; there is a distinct crest which the bird always holds erect; the bill is short, strong, and sharply hooked, the legs are feathered to the toes, which are bare.

The female is browner than the male; has the breast spotted with brown instead of black; and has only a suggestion of the black gorget with white margin.

Writing of the hazel-grouse procured in the Khingan Mountains, Ingram says that "they are exceptionally grey above, while there is much white on the underparts; on the other hand in Sir Evan James's specimens rufous and brown are the prevailing colours." This almost suggests that the South Manchurian hazel-grouse (James's specimens being taken in the Chang-pai Shan region, I believe,) is yet another distinct subspecies, though it is difficult to believe that two distinct forms occur in the one province.

Of the habits of these birds I have written elsewhere. They inhabit the forested areas exclusively. I opened the crops of some of those that I shot, and found them to contain bits of acorns, leguminous seeds, small portions of roots, and even small sections of the dead tips of pine branches.

In winter the game markets at Harbin display a good many of these birds, where they used to sell at 10 *kopecks* each.

Their flavour is excellent, surpassing any of the other game birds of the district.

144. Sickle-winged Grouse.

Falcipennis falcipennis (Hartlaub.)

Tetrao falcipennis, Hartlaub, Journ. f. Orn., 1855, p. 39.

This grouse, which is distinguishable by its outer flight feathers being sickle-shaped and narrowed towards the extremities, occurs in the Manchurian Region. Schrenck recorded it under the name of *Tetrao canadensis* from the Amur Region.

It is larger than the hazel-grouse, and may at once be recognized by the peculiar attenuated tips of the flight feathers. It is black above including the head and chest; lightly barred with buff; black below heavily barred white; tail black tipped white,

145. Ussurian Black-Cock.

Lyrurus tetrix ussuriensis, (Lorenz.)

Tetrao tetrix ussuriensis, Lorenz, Die Birkhühner Russlands, 1910, p. 3.

The black-cock was reported as occurring in the Kirin forest as long ago as 1886 by Sir Evan James and his party. Some specimens were obtained, which were examined by Mr. Collingwood Ingram in 1909, and reported upon as being the same as the British species. I had an opportunity of examining adult male and female specimens purchased in the market at Harbin, and though I had no European specimens with which to compare them, I could detect no difference between them and illustrations and descriptions of the latter. At best Lorenz's subspecies can only be considered as a geographical race.

So well known a bird as the black-cock scarcely needs description. It may be distinguished at once from all other grouse by its black plumage, large size, and forked tail, in which the outer feathers curl outwards and then forward. It is larger than any of the other grouse of our region, excepting the capercaillie, which is much larger, and has a square-tail, though it also is of black plumage.

Poliakow records the black-cock from the Ussuri region. I saw a single sprecimen on the Heilungkiang bank of the Sungari near its junction with the Amur; but was told that the species was plentiful in this region in Autumn and winter.

The sport of black-game shooting is admittedly one of the best to be had, for there is no gamer bird than this handsome species.

There are instances on record of Europeans enjoying some good black-cock shooting in the Manchurian Region. James in "The Long White Mountain" (p. 344) tells of having seen these birds in large numbers. The party shot several, which they found very good eating, though not as good as the pheasants. Doubtless they were too fresh, for black-game certainly needs hanging for some time to bring it to its full flavour. The birds from all accounts were very tame, and it took a good deal of shooting to drive them away.

Two friends of mine, who were travelling in Heilungkiang, told me of an experience one of them had, which is worth recounting. They were out for sport one day, and one of them, being an ardent fisherman, decided to spend his time catching trout, of which the streams were full; while the other set out after a bear that had recently been seen in the nighbourhood. The angler had his favourite pointer with him, and, while taking a trout off the line, noticed that the dog had come to a 'point' at some thick cover near by. Knowing that the animal never gave a false 'point,' he hurried for his shot-gun, which he had left in a cart some little distance away, and, having secured it, came back to the spot with all speed. At his signal the dog advanced and flushed two fine black-cocks, which the sportsman, being a fine shot, bagged. Up got two more, followed at short intervals by others; while my friend let drive rights and lefts as fast as he could reload his fowling-piece. It was a sensational few minutes, and one such as is vouchsafed to but few men, for, by the time that the last bird had risen and been duly grassed, there were no fewer than eight fine black-cocks and grey-hens lying at his feet, retrieved by his trusty canine companion.

The black-game in these parts appear to be migratory to a certain extent; retiring to the mountain to breed and returning to the flat-lands in the autumn.

Residents at Harbin regularly enjoy good black-game shooting every autumn and winter, though they have to travel some distance to the north-east by train from that town.

146. Small-billed Capercaillie.

Tetrao parvirostris, Bonaparte.

Tetrao parvirostris, Bonaparte, Comptes Rendus, XLII, 1856, p. 880.

The capercaillie which inhabits the Amur region, and is known to extend into Northern Manchuria, belongs to Bonaparte's species, which was described from North-eastern Siberia. There is another nearly related species from Kamschatka, namely *T. kamschaticus*.

According to Ogilvie Grant in the "Royal Natural History" these eastern forms differ from the European species, *T. urogallus*, whose range extends from that continent right across Asia to the Altai Mountains, in having the bill smaller, and in having the

scapulars widely tipped with white; while the females are much darker on the under parts. The Kamschatkan form is smaller than that from Siberia, and also has the white tips to the scapulars forming a band, while in the Siberian form they form a row of dots.

Very much larger than the black-cock, the capercaillie is, next to the bustard, the largest of the game-birds of the Manchurian Region.

147. Willow Grouse.

Lagopus lagopus lagopus (L.)

Tetrao lagopus, L., Syst. Nat., ed. 10, I, 1758, p. 159.

Schrenck records this bird under the name of *Lagopus albus* Gm. There appears to be no difference between the birds that occur in the more northerly areas of the Manchurian Region and the circumpolar form to which Linnæus gave the name of *lagopus*.

A bird of the Arctic regions, and of high mountainous areas in northerly latitudes, the willow grouse is to be found in the Northern part of the Amur, and along the more barren coastal regions. It may readily be distinguished by its brown, closely barred plumage, white lower breast, primaries, legs, and feet, the latter being feathered right down to the claws, and black outer tail feathers. This is the summer plumage. In winter the whole of the plumage is white, except the outer tail feathers, and a dark band through the eye.

According to Clark (*Proc. U. S. Nat Mus.*, *Vol.* 38. p. 54) the name *albus* applies to the birds that occur from Northern Labrador to Point Barrow in Alaska. Another form, *Lagopus ridgwayi*, Stejneger, occurs on Bering Island and in Kamschatka, and it is possible that the birds that occur in the Amur may be referrable to this species, though for the present it seems advisible to consider them as belonging to true *lagopus*.

Family Pterocletidæ.

The sand-grouse appear to form a connecting link between the true grouse and the pigeons. One form only occurs in Eastern Asia, where its true habitat is Mongolia, though it spreads from there into neighbouring regions.

148. Pallas' Pin-tailed Sand-Grouse.

Syrrhaptes paradoxus (Pallas)

Tetrao paradoxus, Pallas, Itin. Vol. II, p. 712. pl. F.

Pallas's pin-tailed sand-grouse is a bird that belongs to the Tartarian or Mongolian avi-faunal sub-region, though by reason of its periodical extensive migrations it is known as a visitor over a very wide area. It has occurred on several occasions in the British Isles, in the extreme west; while it frequently visits North China, sometimes in enormous numbers. It probably breeds in the sandy areas of the Manchurian Region adjacent to Eastern Mongolia, and every winter it is found on the plains of West and South Manchuria.

In the head, the long, pointed wings and the size and shape of the body, the sand-grouse undoubtedly resembles the pigeons or doves; but the bill is shorter, and the feet, in which there are only three thick, stubby toes, are feathered down to the nail. The feet bear an extraordinary resemblence to these of a rabbit or hare. The flight feathers are very long and taper to a long, fine point, as also do the retrices. The general colour of this bird is a sandy-buff, the male having a rusty red colour on the forehead, and throat, and a broad black band across the lower breast, just in front of the legs; the back is prettily marked with short black bars; the flight feathers, and tail feathers are of a steely-grey.

The sand-grouse is a very sporting bird, and when it appears from Mongolia in large numbers, that is, when heavy snowstorms occur in the latter country and cover its feeding grounds with a thick pall, splendid shooting may be had by the sportsmen of North China and South Manchuria. It is a very fast flyer, and individually offers a difficult target. Usually it flies in large flocks, which may be browned, and several birds brought down at a time, if sufficient lead is given. I have seen a long drawn out flock completely missed by a good shot at thirty or forty yards, which will give some idea of the speed at which the birds were travelling.

Family Columbidæ.

The doves and pigeons of the Manchurian Region are, for the most part, resident in the country throughout the year, though there are some notable exceptions. Altogether some five different forms occur in our region.

149. Bar-tailed Rock Dove.

Columba rupestris turkestanica, Buturlin.

Columba rupestris turkestanica, Buturlin, Orn. Ononats., Vol. XVI, 1908, p. 45.

A bar-tailed rock dove occurs in Manchuria, and, in all probability, is referrable to Buturlin's subspecies *turkestanica*, whose range appears to extend into this country from North China. This bird differs from the European rock dove in having a broad white band across the tail just in front of the black terminal band. Otherwise it closely resembles the European form, which should be familiar to everybody in the common blue-rock of our dove-cotes. The blue-grey colour is lighter in the wild species, and the bands on the wings more pronounced.

I saw flocks of the bar-tailed rock dove on the cliffs of the Yalu and Upper Sungari Rivers.

150. Manchurian Wild Pigeon.

Columba taczanowskii, Stejneger.

Columba taczanowskii, Stejneger, Proc. U. S. Nat. Mus., XVI, 1893, p. 624.

This, the common wild pigeon of these parts, may be distinguished at once from the rock dove, with which it sometimes associates, in having no white bar on the tail, and in having the upper parts of a deeper grey.

I saw what I took to be this pigeon on the plains of Eastern Manchuria, where, as in North China, it is to a certain extent domesticated, and frequents lofts and the eaves of old buildings.

Stejneger's species takes the place in the Manchurian Region of the Chinese *C. intermedia* Strickland.*

151. Eastern Turtle Dove.

Turtur orientalis (Latham).

Columba orientalis, Latham, Index Orn. II, p. 606, 1790.

This fine dove, which is almost the size of a pigeon, is extremely plentiful in the Manchurian forest, where it builds its loose nest

* *Ann. and Mag. Nat. Hist.* p. 39, 1844.

of pine twigs and needles in the lower branches close to the trunk of pines and other conifers. It is somewhat handsomely coloured and marked, having the upper parts of a dark smoke-grey, the edges of the feathers on the shoulders and scapulars being edged with chestnut, those of the rest of the wings being edged blue-grey; there is a band of black feathers tipped with blue-grey on either side of the neck; the throat is light-buff; the rest of the lower parts of a pinky-grey, darker on the chest; the tail-feathers are black with broad grey tips; the bill is black; eyes crimson; feet dull crimson or carmine.

The bird differs from the European turtle dove in being larger and altogether more handsomely coloured.

Ingram records this dove from Kirin, where also I secured specimens.

This dove, though it may be found in the country in winter, is also to a large extent migratory. I have encountered it at sea while crossing the Gulf of Pechili.

152. Indian Ring Dove.

Turtur risorius, (L.)

Columba risoria, L. Syst. Nat., I, p. 285, 1766.

The ring dove that occurs in Manchuria appears to be identical with the species that occupies China.

Of a light fawn-grey, this bird may be recognized by its plain plumage, and the presence of a black neck-ring. It is smaller than the turtle dove, and is an inhabitant of open country and plains.

It is recorded by Taczanowski in his "Faune de la Siberie Orientale" as from Poste Marinsk (Lat. 52. N.), which gives an idea of the range of this species. I have shot it in winter on the Tai-yuan Fu plain in Shansi, but cannot say whether it is to be found in the Manchurian Region all the year round. It may winter in South Manchurian.

153. Chinese Ruddy Ring Dove.

Oenopopelia tranquebarica humilis, (Temminck).

Columba humilis. Temminck, Pl. Col. pp. 258 and 259, 1838. also Tem. and Knip. Pig., II, pl. 7, 1811-1857.

This pretty little dove is a summer visitor in the Manchurian Region. Buturlin records it from the Ussuri region, which place it doubtless reaches by way of the Corean Peninsula.

It has the head ashy grey, with a broad black collar on the neck; the back, scapulars, wing-coverts and breast are a vinous-chocolate-grey; the lower back, rump and tail dark slate grey, the latter tipped with white; the primaries dusky. It is a small dove measuring not more than 9 inches in length. The female lacks the rich colouring of the male, being a rather dark fawn-grey, much the colour of the ring dove, but darker.

It must be very rare in the Manchurian Region.

Family Otididæ.

The family *Otididæ* is represented by but a single species, namely, the Eastern great bustard (*Otis dybowskii*). The bustards do not belong to the true game-birds, nor yet the doves, but are related to the plovers and cranes. However, as they must be considered as game-birds, I prefer to deal with our single species here, in spite of the fact that it is entirely migratory.

154. Eastern Great Bustard.

Otis dybowskii, Taczanowski.

Otis dybowskii, Taczanowski, Journ. f. Ornith., pp. 331 and 336, 1874.

The bustard is the largest of the game-birds, and a very handsome and sporting bird. The eastern form, which occurs in Mongolia, China, Manchuria and Eastern Siberia, at least, resembles its western relative, *Otis tarda*, in size, shape and appearance, but differs in having a much greyer neck and breast, and grey wings instead of buff barred black.

The head, neck, wings and chest are ashy grey; the breast, lower parts, and under tail-covert white; the back, scapulars, rump, and upper tail-covert are chestnut-buff, well barred with black; the

Photos by J. D. de La Touche.

The Eastern Great Bustard (*Otis dybowskii*, Tacz.), shot at Chin-wang Tao, N. E. Chihli.

tail feathers are grey with black tips in the male, chestnut-buff, barred black in the female; the flight feathers are blackish-grey, white at the base. The male has long grey feathers on the sides of the throat, the female shorter ones. The bill is grey-black, the legs grey, the eyes brown. There are only three toes which are short and thick.

Their plumage harmonizes so well with the drab colour of the plains in winter, that it is often very hard to detect these large birds, even when at no great distance from them.

It is probable that the bustard breeds in the Manchurian Region on the borders of Eastern Mongolia. It winters on the plains of the west and south.

CHAPTER IV.

Bird Migration.

Happy birds that change their sky,
To build and brood, that live their lives
From land to land.

—*Tennyson.*

CHAPTER IV.

Bird Migration.

Of all problems in connection with the study of birds, those of migration are at once the most fascinating and difficult of solution. The enquiring mind begins by wondering why it should take place at all, for many other forms of animal life, such as mammals and reptiles, appear to get on very satisfactarily without migrating, as, indeed, do a great many of the birds themselves. Why should so many birds feel the necessity of moving northward in the spring, and southward in the autumn; why are they not content to spend their whole lives in one locality, as many others do? As one considers this phase of bird life, one begins to see that many advantages are enjoyed by the migrants that are denied the resident species.

This being so, the next question that comes to the mind is: How did the instinct or habit of migration originate? This is followed by the question: Why should it have been to the North Polar regions that the birds have learned to repair for breeding purposes, and not to the South Polar regions?

Immediately one begins seriously to contemplate the subject, a thousand questions cry for answer, and so complex does it seem, that, at first, one is tempted to leave it without attempting to arrive at any definite conclusions, and so to avoid many pitfalls that lie in the path of the investigator. Yet such a course were as unsatisfactory to the reader as to the writer. The subject is too fascinating to leave without an attempt to arrive at some definite conclusions in regard to it; and, in an effort to do so, the reader's indulgence is asked, and more especially that of the student of ornithology, if ground that he has already covered is gone over again.

First and foremost it may be assumed that it was the development in birds of the power of flight, and therefore of easy locomotion, that was primarily responsible for the migration habit. Without this they could never have acquired that habit. Some means of easy and rapid transit is an essential factor in migration;

and we have examples of this in the bats, which, with the exception of the North American reindeer, or cariboo, and the North European lemmings amongst land animals, and certain seals and others marine forms, are the only truly migratory mammals. The latter, of course, have an easy means of transit in the sea, such as is denied land animals. Many species of marine fish also are migratory. Migration takes place amongst certain species of butterflies, and also in the well known locust, though in the latter it cannot be considered as anything like the regular north and south migrations of birds, for it is irregular, and haphazard; the locusts simply move altogether in one direction, feeding as they move, with no particular purpose or destination. Snakes, lizards, frogs, and the vast majority of mammals, on the other hand are non-migratory; their means of locomotion are too slow and tedious to allow of it.

Thus with birds, given the power of flight, the use of that power in a search for congenial or favourable localities wherein to live follows as a natural result.

However, all birds are not migratory, many species having found, in the course of evolution, that it was profitable to remain in one locality the whole of the year, and the reason for this is the first question the student seeks to answer. Obviously the answer is to be found in the history of the evolution of birds as a whole, as well as of each individual species. Resident birds must have found themselves in occupation of country where they could breed and live in safety the year round. They had to develop certain characteristics, nesting habits, protective colouring, and so on, in order to do this and survive. Nature finds a way for the survival of her children. It may have been that these residents had not developed the power of flight to the extent that the migrants had, so that when overcrowding began to take place, they stayed, while the ancestors of our present day migrants began to move further afield, with the result that the latter gradually, very gradually, during immense periods of time, developed the migratory habit, for which they became adapted at the same time.

This view as regards the migrants was well expressed by Dr. A. R. Wallace* in 1874, when, after pointing out that the survival of the fittest is chiefly responsible for the migratory habit,

* *Nature, Vol. X, p. 459.*

he says: "Let us suppose that in any species of migratory bird, breeding can, as a rule, be only safely accomplished in a given area; and further, that during a great part of the rest of the year sufficient food cannot be obtained in that area. It will follow that those birds which do not leave the breeding area at the proper season will suffer, and ultimately become extinct; which will also be the fate of those which do not leave the feeding area at the proper times. Now if we suppose that the two areas were (for some remote ancestor of the existing species) coincident, but by geological and climatic changes gradually diverged from each other, we can easily understand how the habit of incipient and partial migration at the proper seasons would at last become hereditary, and so fixed as to be what we term an instinct." Nothing more than the above explanation is needed to account for the origin of the migratory habit, or instinct, but it does not explain why migrations should be northward in spring and southward in autumn.

Canon H. B. Tristram* in an able paper entitled "The Polar Origin of Life in its bearings on the Distribution and Migration of Birds" suggests that the theory of a polar origin of life helps very considerably in elucidating the mystery of bird migration. That life on this earth originated at the poles is a very feasible theory, for naturally the polar regions, as the earth cooled down, must have been the first to become habitable for organic life as we know it; though it does not follow that that organic life reached a very high state of development before the rest of the earth was populated by organisms; nor does it follow that the life that started at the poles was the beginnings of all life on the earth. Nevertheless, that life did reach an advanced stage at the poles is evidenced by the discovery of coal in both Antarctic and Arctic regions, while the existence of the mammoth and other large mammals in inter- and post-glacial times along the Arctic shores of Siberia, show that at no very distant times it was in a very high state of development.

Let us, then, for the sake of argument, assume for the moment that bird life as we know it did originate at the poles. We at once find an easy way of accounting for the general directions of present day migrations. Granted that there was a period when birds bred and fed the year round in a limited area, it is obvious that if that

* *Ibis, 1887, pp. 236.-242, and 1888, pp. 204-216.*

area were at the poles the only direction in which the adventurous pioneers of migration could move would be away from the poles—*i.e.* either north or south according to whether they were at the South or North Pole—and that when the nesting and laying impulse came over them they must return to their particular Pole for the purpose. Following Wallace's argument, we may say that bit by bit the radius of migration increased, and so came about an "incipient and partial migration" in a north and south direction.

Now in addition to the formation of the migratory habit, we have the steady cooling of the polar, and circumpolar regions, which would tend to further differentiate the migratory and non-migratory birds, emphasizing in the former the migratory and in the latter the sedentary habits. In course of time the temperatures of the Poles became so low as to prevent the existence of any form of life there, while circumpolar regions became so cool as to allow of bird habitation only during a part of the year. At the same time other regions of the earth became habitable for birds all the year round. Thus only such birds as had become migratory could breed in the circumpolar regions, while resident species died out or by very slow degrees moved south.

This explanation is very ingenious, and though it cannot be admitted that bird life originated at the Poles, yet it seems probable that at one time in the history of the world bird-life was very abundant in polar regions, and that it was the advent of the Glacial Epoch that started the birds moving away from their habitats during the colder parts of the year, and so began the phenomenon of migration, giving it the first north and south direction, to which it has adhered ever since by the very nature of things.

In addition to this general explanation, it would seem that there are other subsidiary yet important factors which have contributed to the present state of affairs in the bird-world. Of these three may be cited as of paramount importance, all three being inter-dependent upon the march and counter march of the seasons. They are:

1. The need on the part of most birds, with their delicate constitutions, to live as much as possible in atmosphere of the same average temperature.
2. The need of adequate food supplies for themselves and their progeny.
3. The need of safe and suitable breeding grounds.

Taking the first of these, it is well known how susceptible many birds are to changes in temperature. Of high temperatures themselves, they do not appear to be able to withstand any very great lowering of the temperature of the air surrounding them, nor yet to survive any very great increase therein. It is true, of course, that many birds actually do survive comparatively great extremes of temperature, but after all their numbers are not so very great. To the former category belong most of the passerine migrants and such birds as the cuckoos. Wintering in rich tropical, sub-tropical or even south-temperate regions, their breeding haunts cannot vary in the matter of food supplies, or of safe nesting sites, very much from their winter haunts. Many birds of similar habits and requirements remain the year round in the southern areas; but these differ in one particular, they have become accustomed to the increased summer temperatures.

Now how can those species that require a mean temperature the year round find it other than by following the spring nothward and the autumn southward, There is another way, and it will be found that many birds that are called residents in a country follow it. It is to ascend to highlands or mountains, where such are convenient. But there are many warm countries where there are no such convenient highlands, and even where these do occur they are totally inadequate to offer suitable breeding grounds with a sufficiency of food to all the vast numbers of migrants; while northwards, in the lands that have been bound by ice and snow during winter, there is abundant room and food for all.

This brings us to the second cause contributive to the north and south migration of birds, namely the need of adequate food supplies. One can easily see how that if all birds stayed in countries where both breeding and feeding all the year round are compatible, that is, the warmer countries, there would not be sufficient food for them all. The round of the seasons brings its stores of food, and if these were consumed at once many birds would perish from starvation. What actually happens under existing circumstances is that the migrants come from the north in autumn just in time to partake of the rich summer's yield in the warmer countries. That harvest lasts them throughout the winter; but in spring becomes exhausted; nature needs time to replenish the stores; and it is only the fact that so many birds go north, that

makes it possible for those that remain to tide over the hunger season while nature is getting ready to restock. But what of those that went north? Have they sufficient food? Most assuredly. Nature was just as bountiful throughout the country they traversed on their way from their breeding grounds to their winter haunts, but, hurrying southward, they did not consume all, or nearly all, the food. Much was left for the comparatively few winter residents, and much still remains for the returning migrants. By the time they have reached their breeding grounds nature has shaken off the bonds of winter, and after her long sleep is bursting into intense activity. She has to crowd a great deal of growth and development into a comparatively short period, and by the time the young are hatched, there is an abundance of insect food, followed soon by berries and vegetable food of various kinds.

Take as an example the ducks and water-fowl generally of Eastern Asia. Coming south in the autumn, they find food plentiful all along the way; the swamps, lakes, and waterways are filled with edible weeds; the cultivated fields are strewn with fallen grain of all sorts; but the birds do not consume everything. Keeping ahead, often only just ahead, of the on-coming cold and frosts of winter, they are driven on before they deplete the stores of food too much. They arrive at their winter quarters, where they find all kinds of food in the great lakes and swamps of the Yang-tzu valley, in the reed-beds, and again upon the cultivated fields. So vast are their numbers, however, that by the end of the winter this food supply is practically gone, and very early they begin moving northward again, feeding as they go, till at last they make their final rush to their breeding haunts once more. Here they feed at first upon the food left over from the previous season, then, as the young are hatched, upon the myriads of aquatic insect larvæ, and the fresh young blades of grass, and later upon the berries that grow upon the low shrubs, and so complete the round of the season.

The most important factor, and probably the one that has had most to do with the direction of bird migrations, is that of the need of a safe and suitable breeding ground.

It appears that for the majority of the wild-fowl, waders, and the like, the tundras of Northern Siberia, and the Arctic shores of North America offer the most, one might almost say the only, favourable conditions for breeding. These birds nest chiefly upon

the ground, and many of them, the wild-fowl in particular, lose the power of flight during the incubation period, by reason of their moulting, and so it is particularly important that their breeding grounds should be free from carnivorous mammals. Then, too, so prolific are they, and so numerous, that it is necessary for there to be an abundant food supply. These two conditions occur only in north circumpolar regions. The South Polar regions are altogether too barren and inhospitable, and are too far away from any extensive land areas to offer a suitable breeding ground to any but purely fish-eating birds; and of these but few have chosen to breed there. Incidentally, the chief amongst them are the penguins, who, being flightless, arrive and depart by water. They, being what they are, could not survive in the Arctic regions. The land masses would make it extremely difficult for them to get sufficiently far away from the Pole in winter. The only flightless bird that inhabited Arctic regions, the great auk, has become extinct.

There are, of course, many extensive marshes in north-temperate regions that would be suitable for the aquatic birds such as the waders and wild-fowl, and it will be found that wherever these occur they are used by certain species as breeding grounds; but they are inadequate for the vast numbers of migrants, and are too unsafe in many ways for large numbers of birds to breed in them.

Other forms of migrants find more suitable breeding grounds in the northern sections of the great land masses that surround the North Pole; the great Siberian forests afford ideal resorts for passerines, such as warblers, flycatchers, thrushes and wagtails, as well as cuckoos, rollers and the like; the rolling grass-lands, and scurb-covered hills and mountains attract buntings, finches, larks, swallows, swifts, bustards and cranes; the sheer cliffs and uplands of the northern coasts and islands form ideal homes for gulls, and other marine birds,—all of which are forced to travel southward when the winter, with its storms and blizzards, and cruel cold, comes on.

Having come to the above more or less definite and satisfactory conclusions on the origin of the migratory instinct in birds, and the causes which have brought about its general direction, we may turn to other questions, one of the first of which is that, granted

the migratory instinct in a given species, how does it act upon the individual, or rather what acts upon the individual to send it north or south at the right season?

It has been suggested that the changes that take place in the sexual organs of the birds in the spring cause them to start for their breeding grounds. Doubtless there is a good deal in this theory; but it needs proof. I am inclined to the belief that the temperature of the atmosphere and meteorological conditions generally are responsible to a large extent for the impulse in birds to move northward. If the winter is late in breaking, and the warmer temperatures of spring are delayed, the migratory birds also are late in moving northward. Sometimes a few bright warm days in early spring are marked by the appearance of certain migrants, which disappear again if the weather turns cold. The same thing happens in the autumn; a few warm days in late Autumn will often see the return of certain migrants, which a few days before had gone southward.

The dates, or approximate dates, when the migrations commence vary with the species, and even with the individuals, and, though it is an interesting study, nothing much can be written about it in regard to the birds of the Manchurian Region for the simple reason that very little data upon the subject has been collected. Before anything definite on this score can be presented to the public a long series of observations must be carried out at a great many stations scattered over this part of the globe, not merely of the birds themselves, but also of prevailing weather conditions. Splendid work in this line has been, and is still being, done in regard to the birds of America and Europe, but very little has been done in Eastern Asia.

Such observations will also establish the routes used by the various species, which also is a phase of our subject that cannot be touched here, though from what we already know it is possible to define roughly certain widely used and general routes.

We now come to what are, perhaps, the most interesting phases of bird migration, namely, the means by which birds find their ways to and from their breeding grounds; the influences governing them in the choice of the routes they take; and the locations of those routes.

Taking the first of these: What guides the migrants when once they have started on their long journey? This is a question that up to the present has not been definately answered, nor is it likely to be for a long time to come. To every explanation that has been offered objections have been found; yet it is difficult to believe that all are wrong. It seems probable that, as with so many problems to do with animal and plant life, each phenomon observed can be explained by no single cause, but rather is attributable to a number of causes, all acting in a greater or lesser degree upon the organism in question to produce that phenomenon. For instance we have seen how that in the evolution of the migratory instinct in birds and the directions their migrations take, their were, and are still, at work three main causes, though there may have been, and probably are, many minor ones, which, acting and reacting upon the various species involved finally brought about, and still maintain, a north and south migratory instinct in those species.

Let us then seek for the agencies whereby birds manage to find their way so unerringly to their desired destinations.

In the first place, whatever mental powers we believe or disbelieve birds to have, we cannot deny them an unusually strong sense of direction. There is not the least doubt that such a sense is possessed by many living organisms. Man himself has it, though by reason of his many other faculties, he has come to depend very much less upon it in finding his way about the face of the earth than did his primitive forefathers. The sense is more strongly developed in animals than in man, and apparently is even stronger in migrant forms of all classes of animal life.

The movements of migrant birds and of homing pigeons that pass over extensive land areas may possibly be accounted for by their use of familiar land-marks; but this will not account for the way in which gulls, terns and other birds of the high seas find their way about. They have no land-marks to guide them, yet they travel to and from their breeding haunts with just as much precision as do the land birds. Again, it is a fact that many small, rather weak birds cross comparatively wide stretches of open sea, generally at night. Is there any possibility of their keeping their direction by landmarks under such conditions? May we suppose that they guide their course by the stars? It might be suggested

that they have the power to sense the magnetic lines, and, following these, can keep their direction; but such a theory to be accepted would need experimental proof. No; the only way of accounting for the finding by the birds of their way over certain portions, if not over the whole of their migration routes, is to admit of their possession of a highly developed sense of direction.

But the sense of direction cannot be the only means whereby birds find their way to and from their breeding grounds. If it were, we should have a serious state of affairs for the birds; for they would inevitably try to take the shortest route from their winter haunts to their summer resorts, with, in many cases, disastrous results. Doubtless the pioneer migrants often did try to do this, and perished. Probably many birds try it now. Nature is always experimenting; and at times seems reckless of the waste of individual life, if benefit for the race may accrue. And so, as the earliest migrants pushed further and further afield, they would find their ways back to their breeding grounds by a direct line barred, perhaps by an arm of the sea, perhaps by a high mountain range, or even a thirsty desert. Those that tried to cross these perished in large numbers; but a few probably succeeded. Those that circumnavigated the obstacles survived in greater numbers. Thus we find geographical conditions reacting upon the migrants, and modifying their use of the sense of direction. Still the sense of direction continued to act upon them, or to be used by them, and, having gone completely out of their course for a certain distance along the side of some barrier, when they rounded the end of that barrier, they turned once more toward their desired destination. Memory, and possibly later, inherited memory, would be another agent, that now would step in, and the routes found by painful experiment would in the course of time become fixed. Geographical and geological changes would from time to time affect and alter these routes to a certain extent; and probably account for some of the more extraordinary, and seemingly unreasonable migration routes followed by certain species of birds; but more on this point later.

The sense of direction is linked up in the psychology of birds with a homing instinct. There is undoubtedly a tendency, extraordinarily strong in some birds, to return, when removed by some external agency, to the spot where they were born, or where they have made their home. The simplest case is that of the pigeon,

which, taken by man away from its nest or loft, and liberated at a distance, will endeavour to return to that nest or loft with all speed. Other birds, such as the birds-of-passage, and migrants in northern climes, are driven away by cold from their homes; but they return as soon as possible to those homes. This is the extreme case. The swallows that winter in subtropical regions, and breed in temperate and north-temperate regions, form a mean between the two. It is possible that this homing instinct assists in giving the birds their directions; and it probably has its greatest effect in directing them to their old nesting sites, though in this memory of the the geographical features of the country may also take its share.

All this helps to give us a satisfactory explanation of the means by which migrants find their way about, but if we are to account for the fact that young birds are no less certain in their movements, and in following the established migration routes, we must admit that there is some such agent as inherited memory at work. The young bird finds its way unerringly to the winter resort of its species. It is seldom if ever guided thither by its parents, or other older birds, for these generally migrate at a different date from their offsprings. Granted that the young bird has a sense of direction, the latter would be useless if the bird did not have some instinctive idea of where it wanted to go. Thus we have a sense of direction, coupled with a homing instinct, and some such thing as inherited memory, and modified by geographical conditions, together with, in some cases, an acquired knowledge of the topographical features along their route and in the vicinity of their nesting sites, all acting upon the migrant birds to enable them to find their ways to and from their breeding haunts.

The influences that have governed the migrants in the choice of routes, and that either keep them in those routes now, or cause them to vary them in parts, as undoubtedly happens, are the need of adequate food supplies, meteorological or climatic conditions—the former, of course, largely dependant upon the latter—and the physiographical features of the earth's surface.

It has been noticed that migrants follow coastlines and large river valleys to a considerable extent; but often they break away from these, and are known to cross high mountain ranges, when it would appear better to go round them. The fact is physiograph-

ical features of the earth's surface have considerably less effect upon bird migration-routes than has usually been supposed, while suitable feeding grounds *en route* are all important. Nevertheless such a thing as an arid desert has a profound effect upon the courses pursued by birds, and in Eastern Asia we have a very good example of this. The Gobi Desert stretches from north of Thibet, itself an arid country, right across Mongolia, and bites into the more fertile terrain of the Manchurian Region, with the result that the majority of the migrants of Eastern Asia that breed in Siberia are forced to travel to that country by way of Manchuria.

The presence or absence of good feeding grounds along the migration routes often causes considerable local variation in those routes. There is no doubt that, though the main route remains roughly the same from year to year, it changes locally a good deal, which changes coincide with variations in the feeding grounds. For example, Tientsin used to lie right in the path of a tremendous bi-annual bird migration, mainly of aquatic species. Some few years ago, when the town was considerably smaller than it is now, the whole of the surrounding country consisted of marshes, whose waters were annually replenished by the overflow of certain rivers and their tributaries. Swans, geese, ducks, teal, snipe, plovers, sandpipers, wagtails, pipits, reed-warblers, hawks and owls—the last two feeding upon the other smaller species—might be seen in great numbers. Enormous bags of wild-fowl and snipe were made by local sportsman. But in the course of time the rivers have been brought under some sort of control, the marshes have been steadily reduced by drainage, and the countless thousands of aquatic migrants have ceased to appear in the vicinity. The ducks and geese now pass northward much nearer to the sea-coast, for the food in their old haunts has disappeared. The wagtails, pipits, and reed-warblers, followed by the owls and hawks, still show up in great numbers for there is still a good supply of insect food for them. The waders and shore-birds have taken to a route much further inland, where certain large lakes and marshes still supply them with the food they need.

We now come to the study of where the migration routes are. This is a problem which will yield to direct research and observations. It has already been shown that Manchuria, or the Manchurian Region, lies right in the path of an immense number of

migrants. It is also a fact, that that region is so favourable to bird life, that it forms the breeding grounds of a very large number of individuals of a great many species that also breed in Siberia. What we now want to know is by what routes do these birds reach their breeding grounds. It has already been stated that, as regards Eastern Asia, we have, as yet, insufficient data to determine the routes of individual species, as has been done in regard to the American birds, and to a large extent with those of Europe; but that from what we do know we may define the general routes taken by our migrants.

Mr. J. D. de La Touche has for a considerable number of years observed and studied the birds of the Chinese coastal provinces, and has established the fact that there is a great movement of migrant birds along the coasts. The coastal provinces of South China, as well as Formosa, the Philippines, and other islands off the mainland, form a veritable paradise of birds, from which a stream of migrants passes up the China Coast as far as the Yang-tzu. Many species appear to turn up the valley of that great river to breed in the interior provinces of North China, or to reach, by way of its tributaries and other routes, suitable breeding grounds along the Sino-Mongolian frontier, and even in Mongolia itself. A larger number, however, continue from the mouth of the Yang-tzu northward, till the Shantung Promontory is reached. Here they divide, some crossing to the Liao-tung Peninsula, others continuing north-westward along the coast and right round the Gulf of Pechili. Many cross the latter from different points on the North Shantung Coast. From the northern rim of the Gulf of Pechili many migrants strike north for the mountainous regions of North-eastern Chihli, where many suitable breeding areas, such as the Tung Ling, occur. Others continue along the coast, now in a North-easterly direction, and pass Chin-wang Tao, where Mr. La Touche has carried out observations, Shan-hai Kwan, and so on to the valley of the Liao River in Fengtien Province. Here they meet the migrants that cross from the Shantung Promontory to the Liao-tung Peninsula; and the two lots continue up the valley of the Liao, some to take up their quarters in Eastern Mongolia, some going north-eastward to breed in Eastern Fengtien and Western Kirin, and many continuing northward into the Khingan Mountains of Heilungkiang, on into the Amur basin, and still further north into Siberia.

Mr. La Touche has observed that the geese along this route travel usually some little distance inland, parallel with the coast, and he states that he never saw any coming from over the sea. As a matter of fact wild geese winter in China all along the Yangtzu Valley, as well as much further north along the valley of the Yellow River, and its tributaries, and on the plains of Central Shensi, Honan, South Shansi, and South Chihli. Some of these migrate more or less due north, and actually cross the Gobi Desert; others pursue a more or less north-easterly direction. In the Wuhu district of the Lower Yang-tzu the white fronted goose is very abundant in winter. I have never seen a single specimen of this species in Shensi, Shansi or Chihli, though I have seen innumerable other geese in these provinces. By what route then does this bird reach its breeding grounds in Siberia? It is my opinion that it strikes across the Yellow Sea to Corea or Japan, and, following those countries, reaches Siberia by way of the Primorsk Coast, and Saghalin Island, or the Kuril Islands and Kamschatka.

This introduces us to another migration route that undoubtedly exists in Eastern Asia. Many birds from the Philippines and Formosa follow the Lu-Chiu Islands to Japan, continue northeast along the Japanese Islands, whence, after splitting up in Yeso, some follow Saghalin Island, others the Kurils and Kamschatka. At the southern extremety of Japan some birds strike across to Corea, and travel along its eastern coast and that of Primorskaya, or the Ussuri Valley by way of Vladivostok. It is also probable that many birds cross the sea from the Shantung Promontory to the West Corean Coast, and, following it northward, reach the mouth of the Yalu River. Many follow that river up its course to the region of the Ever White Mountain, others turn northward up its various tributaries, and reach the South and Central Kirin forests; though, of course many continue northward right into Siberia.

In 1914 Mr. La Touche published a paper in the *Ibis* (Oct. 1914, p. 500-586) containing lists of spring migrants observed at Chin-wang Tao during the years 1911, 12 and 13, as well as notes upon them, and upon the meteorological conditions. He observed some 192 species. I have collected or observed fully as many species in the Tientsin vicinity. In May 1914 I was collecting along the Yalu River, and observed a large number of migrants, collecting a good many species. Many years ago Louis Jouy made

a collection of birds at Fusan on the south-eastern coast of Corea. This collection was reported upon by Mr. A. H. Clark in the *Proceedings of the United States National Museum*. (*Vol.* 38, *pp.* 147-176).

Yet another collection was made at Possiette and Olga Bays on the Primorsk Coast, and was reported upon by Giglioli and Salvadori in the *Proceedings of the Zoological Society of London*, (1887, *pp.* 580-596).

From these and other observations carried out in this general region it may be seen that the above detailed migration routes undoubtedly occur, and with that we may leave the subject till such time as more data in the way of observations by those competent to make them is available.

There is just one more point upon which a few remarks may be made, and that is how certain routes followed to-day by migrants came to be used. I refer to those in which the migrants cross enormous stretches of ocean to reach some island breeding ground or winter resort. It is inconceivable that such journeys were attemped and successfully accomplished in one step. Let us take the case of the Eastern or Pacific golden plover (*Charadrius dominicus fulvus*, Gm.) that nests along the north-eastern shores of Siberia, and in Alaska south of the Bering Straits, and winters in various parts of the Southern Pacific, some in the Hawaiian Islands.

It has been suggested by Mr. Wells W. Cooke of the United States Department of Agriculture Biological Survey, that the ancestors of the birds that now winter in Hawaii originally followed the East Siberian coast, the Kamschatka Peninsula, the Kuril Islands, the Japanese Islands and by this circuitous route reached the Hawaiian group; and that later they began cutting corners till now the great flight of 2400 miles from Kamschatka to Hawaii direct is easily accomplished. This is excellent as far as it goes, but it does not explain how the birds came to use the chain of islands that fringe the East Asiatic coast in the first place.

It seems to me that such cases can only be explained by supposing that birds at first used all-land routes, though keeping mainly to sea coasts, and that in the case under discussion, and all such cases, it was the subsidence of land areas, and the gradual widening of the gaps between the islands left behind that made

it imperative for the birds either to seek new routes or to aquire the power and habit of crossing stretches of open water. When we consider how slowly any subsidence takes place, it is not difficult to see how by easy stages the migrating birds would be led on to cross larger and larger stretches of water till such a flight as that already mentioned becomes possible.

NOTE.—Since writing the above I have read Mr. T. A. Coward's splendid little volume called "The Migration of Birds" first published in 1911, but of which I was unable to get a copy before. I cannot do better than to advise all readers of this book who are interested in the subject of bird migration to secure and read this instructive little book, which is published by the Cambridge University Press. Another important work on the subject are the two volumes of Mr. W. Eagle Clarke's "Studies in Bird Migration;" while Mr. W. W. Cooke's publications upon the subject will be found invaluable to the student.

CHAPTER V.

Migrant Birds that Breed in the Manchurian Region.

Passeres.

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Migrant Birds that Breed in the Manchurian Region.

PASSERES, (Perching Birds.)

The Manchurian Region, belonging, as it does, in part to the Siberian avi-faunial sub-region, in part to that of East China, and in part to that of Mongolia, in all three of which many forms of migrant birds find suitable breeding grounds, boasts a long list of summer visitors. The country affords ideal conditions from April to September for all kinds of bird life.

The climate, though moist, is not too damp, and what is more important, is dependable. There are none of the vicissitudes, such as protracted drought, or torrential rain, and irregular, devastating floods, that visit neighbouring North China. There are floods, of course, but they are of regular occurrence, and so may be evaded. The forested areas, especially of the higher parts, offer shelter and an abundant food supply to the smaller migrants such as warblers, flycatchers and the like. The great river valleys, especially those of the Lower Sungari, the Amur, and the Ussuri, with their wide swamps full of fish and other forms of animal life, upon which aquatic birds may feed, attract large numbers of breeders—wild-fowl, cormorants, bitterns, spoonbills, terns, grebes, moorhens and coots. The fertile plains of the west make ideal nesting haunts for such birds as larks, while to the mountain fastnesses of the Khingans repair owls, woodpeckers, hawks, eagles, swifts, and a great many smaller birds. But all of these are not merely summer visitors, many having been already dealt with as residents.

Of the birds that visit the Manchurian Region to breed, subsequently leaving the country for more southerly climes, the majority are passerines, belonging to the families *Fringillidæ*, *Sylviidæ*, *Laniidæ*, *Hirundinidæ*, *Turdidæ*, *Muscicapidæ*, *Motacillidæ*, *Sturnidæ*, *Regulidæ*, *Oriolidæ*, *Zosteropidæ*, *Campephagidæ*, and *Dicruridæ*, or the finches, warblers, shrikes,

swallows, thrushes, flycatchers, wagtails and pipits, starlings, goldcrests, orioles, silver-eyes, minivets, and drongos. The rest of the summer visitors are made up of the cuckoos, hoopoes, nightjars and swifts, one species of woodpecker, the wryneck, and a number of aquatic forms, such as the grebes, gallinules, herons, storks, spoonbills, divers, and cormorants.

Members of all or most of these species pass into, and breed in, neighbouring Siberia; but they cannot therefore come under the heading of birds-of-passage; though some of the latter may actually be found breeding in the Manchurian Region.

In the present chapter only the passerine breeders will be dealt with, and the first family to be noticed is that of the finches, which is represented in our list by one grosbeak, (*Eophona melanura migratoria*) and a number of buntings.

Family Fringillidæ.

There are some twelve species belonging to this family to be considered here, eleven of which are buntings. All the buntings are more or less migratory, as, indeed, are many finches; but whereas many of them are partial migrants, and may be found in different parts of the country at different seasons, these twelve species leave the country altogether in winter.

155. Migratory Grosbeak.

Eophona melanura migratoria, Hartert.

Eophona melanura migratoria, Hartert, Vögel Parläarkt. Faun., I, 1903, p. 59.

Though considerably smaller than its near relative, the masked grosbeak (*Eophona personata magnirostra*, Hart.), the migratory grosbeak is not at all unlike it in general appearance, and at a distance might easily be mistaken for it. The latter, however, has the black of the head extending further down the throat, on to the nape, and taking in the cheeks. The grey is washed with buff on the breast and brown on the back, while the lower flanks are distinctly chestnut-buff. The white band is present on the primaries, but in addition the ends of these feathers are often white, or partly so. The bill, which is smaller in proportion, is yellow with a blue-grey base; while the edges and tips of the mandibles are blue-black.

As its name suggests the species is migratory. It appears in April and nests in the Yalu Valley, and other suitable places right up to Northern Manchuria, whence Ingram records it in August from the Kirin plain. I saw large numbers while on the Yalu in May, 1914.

Mr. Riley has recently named a related subspecies, *Eophona melanura sowerbyi* from Central China, which he describes as being generally much lighter than *E. m. melanura*, and larger and a little lighter than *E. m. migratoria*.

156. Pine Bunting.

Emberiza leucocephalos, Gmelin.

Emberiza leucocephalos, Gmelin, Nov. Comm. Petrop. XV, p. 480, pl. 23, fig. 3, 1771.

The pine, or white-headed, bunting has been recorded by Ingram as being abundant in the Khingan Mountains during the breeding season. It is common in North China.

It has the crown white; the throat, and side of the head chestnut-red, often speckled white; the upper parts much as in the rustic bunting; the lower parts white, lightly streaked on the flanks, and indistinctly spotted on the chest with chestnut. It is rather a large bird.

157. Chestnut Bunting.

Emberiza rutila, Pallas.

Emberiza rutila, Pallas, Reis. Russ. Reich. III, p. 698, 1776.

Recorded by Bianchi from Manchuria, this bunting has the head, throat, gorget, neck, and upper parts a fine chestnut-red, the lower parts are a deep primrose yellow. It differs thus from *E. aureola*, in which the throat, cheeks, and sometimes the forehead are black.

I secured specimens in the Tung Ling area of North-eastern Chihli in July.

158. Yellow-breasted Bunting.

Emberiza aureola, Pallas.

Emberiza aureola, Pallas, Reis. Russ. Reich. II, p. 711 1773.

This well known species is, perhaps, the commonest of all the migrant buntings in these parts, as it occurs in enormous numbers, especially during the migratory season. It breeds

throughout Siberia, Inner and Northern Mongolia, and in Western and Northern Manchuria, wintering along the Yang-tzu, and in Central and Southern China. It was recorded by Poliakow from the Ussuri; while I came across it in both Fengtien and Kirin.

When in full plumage the male is a handsome bird. It has the head, back, wing-coverts and a band across the chest of a rich chocolate-red; the cheeks, throat and sometimes the forehead, black; the wings and tail brown, with a large white patch on the former; the throat, breast and lower parts of a fine, rich yellow. In the female the upper parts are speckled brown; the lower parts yellowish. The young males resemble the females.

159. Yellow-throated Bunting.

Emberiza elegans, Temminck.

Emberiza elegans, Temminck, Pl. Col. p. 583, 1838, and Temminck and Schlegel, Faun. Jap. Aves. pl. 55, 1850.

This is another very handsome member of the *Emberizinæ*, which probably breeds in Manchuria; though not as yet actually recorded as doing so. La Touche records it as a migrant passing Chin-wang Tao, and Taczanowski records it from Corea. It does not occur in North China in the winter, though it is common there during the migrations. I secured specimens in the Tientsin district.

The crown, cheeks, and chest are black; the throat is bright yellow with a white band between it and the black of the chest: a bright yellow band extends from above the eye to the back of the head, and when the crown feathers are elevated, in which position they are usually carried, the yellow is displayed to its full advantage; the back is a greyish-brown, speckled or streaked with chocolate; the wings and tail are brown; the lower breast and belly a dirty white, the flanks being lightly streaked with chestnut.

160. Grey-headed Bunting.

Emberiza spodocephala, Pallas.

Emberiza spodocephala, Pallas. Reis. Russ. Reich. III, p. 698, 1776.

The grey-headed bunting may be recognized at once by its dull olive-grey head and chest; grey-brown back, streaked with

black; yellowish breast and under parts; and brown wings. It is an inconspicuous bird, and so, doubtless, escapes notice. It is, nevertheless, fairly common.

Ingram records it from the Khingans during the breeding season, and La Touche as passing through Chin-wang Tao in the migratory seasons, generally in large numbers. It makes its first appearance in these latitudes during the latter part of April. Poliakow records it from the Ussuri, and Taczanowski from Corea.

161. Grey Bunting.

Emberiza fucata fucata, Pallas.

Emberiza fucata, Pallas, Reis. Russ. Reich., III, p. 698, 1776, also Itin. App., No. 22.

Recorded by Taczanowski from Corea, and by Pallas from Siberia it is evident that this bird occurs in the Manchurian Region, where it probably breeds.

It may be recognized by its grey crown, nape, sides of neck, all spotted with rows of black dots; the cheeks and ear-coverts are chestnut; there is a black mustache streak, mounted by a white or cream streak; the throat and chest are cream-white, edged with a band of black spots and short streaks; below this is a band of chestnut; the lower parts, including the under tail-covert, are buff; the upper parts are brown, strongly streaked with black; the tips, and outer webs of the outer tail feathers are white, the rest being grey-brown, or dusky.

162. Little Bunting.

Emberiza pusilla, Pallas.

Emberiza pusilla, Pallas, Reis. Russ. Reich. III, p. 697, 1776.

This bunting may be recognized at once by its small size. The crown and cheeks are of a reddy-chestnut, with two black bands, one on either side of the crown, and light buff eyebrows; the back and upper parts generally are brown, streaked with black, the outer webs of the secondaries being chestnut; the throat, chest, breast and belly are a dirty white, streaked on the chest and flanks with dark brown.

The little bunting breeds in Siberia, where Seebohm found it particularly plentiful in the valley of the Yenesie. Ingram records it as breeding in the Khingan Mountains. La Touche records it as very common at Chin-wang Tao from April 11th to May 23rd; while I have secured it in the Tientsin district.

163. Yellow-browed Bunting.

Emberiza chrysophrys, Pallas.

Emberiza chrysophrys, Pallas, Reis. Russ. Reich. III, p. 698, 1776.

The yellow-browed bunting is not a very common species in these parts. Radde records it from Eastern Siberia where it breeds. It also probably breeds in the Amur at least, possibly further south in the Manchurian Region La Touche reports it but a few times at Chin-wang Tao.

It has the head black, with bright yellow eyebrows, a white streak on the crown, and white mustache streaks; the throat also is white; the back and upper parts are brown; the breast and lower parts white; the chest light brown or buffy, with black streaks; there are also black streaks on the flanks.

164. Tristram's Bunting.

Emberiza tristrami, Swinhoe.

Emberiza tristrami, Swinhoe, Proc. Zool. Soc. Lond. 1870, June 9, pp. 441 and 442.

This is another of the rarer buntings, recorded during the migratory season by La Touche at Chin-wang Tao, but not obtained either by Ingram's collectors or myself.

It has the head and throat black, with white eyebrows, white streaks on the crown, and white mustache streaks; it is brown above, light below, with a few streaks on the breast and flanks.

165. Finch-billed Reed-Bunting.

Emberiza schœniclus pyrrhulinus, Swinhoe.

Emberiza pyrrhulina, Swinhoe, Ibis, 1876, p. 333.

This bird differs from true *schœniclus* in having a much heavier bill. The head, throat and gorget are black, with an inclination to white or buff eyebrows, and a light mustache streak; there is a broad white collar posteriorly; the breast and lower parts are

dirty white, with faint chestnut streaks on the flanks; the back and wing-coverts are chestnut-buff, with black streaks; the wings and tail as in other buntings.

Bianchi records *Cynchramus schœniclus minor*, Midd. from South Monchuria: but I secured species of *pyrrhulinus* during the spring migration of 1914.

166. Chinese Reed-Bunting.

Emberiza yessoënsis continentalis, Witherby.

Emberiza yessoënsis continentalis, Witherby, Bull. B.O.C. CLXXXVII, Vol. XXXI, p. 74, 1913.

This bunting has the head, throat, and gorget black, with distinct white eyebrows, and often white speckling on the black; the sides of the neck below the black are white, the nape and upper back light chestnut; the back and wings light chestnut-buff, streaked with black; the breast buff with chestnut streaks on the flanks; the under tail-covert white; in which it differs from true *yessoënsis*, the island form. It is smaller than *E. schœniclus pyrrhulinus*, and has a small bill. It is not so black about the head, neck, and back as *E. pallasi*. La Touche records this bunting at Chin-wang Tao from March 9th to May 19th.

Family Zosteropidæ.

The silver-eyes are represented in these parts by a single species. These are small birds of a greenish colour, with a conspicuous white ring round the eye. They are related to the Timalines, or babblers.

167. Red-flanked Silver-eye.

Zosterops erythropleura, Swinhoe.

Zosterops erythropleura, Swinhoe, Proc. Zool. Soc. Lond., 1863, p. 204.

The little silver-eye which occurs in North China and Manchuria might at first sight be taken for one of the willow wrens as it dodges about through the bushes, but a closer inspection reveals it to be a very different bird.

About the size of a small tit its plumage is of a bright olive-green on the head, neck and upper parts; the eye is surrounded by a narrow, but conspicuous white ring; the throat is light green-

yellow; the chest a pale grey, shading into white on the lower parts; the flanks are washed with a light chestnut-red; the under tail-covert is a pale straw yellow.

This pretty little bird appears in spring about March, and seeks its breeding haunt in some secluded spot in mountainous country. It appears again in September on its way south to the central and southern provinces of China where it winters. Though a fairly common bird, it is seldom seen in a wild state, owing to its shy nature. It is a favourite cage bird with Chinese, and large numbers are caught in the Autumn for the market.

Schrenck records *Zosterops chloronatus*, Gould, from the Amur, but it was probably this bird that he was referring to.

Family Oriolidæ.

Only one species of oriole occurs in the Manchurian Region, but it is very common.

168. Black-Naped Oriole.

Oriolus indicus Jerdon.

Oriolus indicus, Jerdon, Ill. Ind. Orn., pl. XV, 1847.

The oriole which occurs throughout China, and thence spreads into Manchuria, differs from the golden oriole of Europe in having a black band extending from the base of the bill through the eye on to the back of the head and nape, where it meets that from the other side of the head to form a black patch on the nape. It also has the yellow of the mantle extending over the wing-coverts on the secondaries. In the European bird only a very narrow band passes through the eye and ends just back of it, while the wing-coverts and secondaries are black. In other respects, colour, size, shape and habits, the two species are practically identical.

The oriole is a very common summer visitor throughout Manchuria. I came across it on the Yalu, throughout the Kirin forests, and also on the Heilungkiang bank of the Lower Sungari River.

Family Sturnidæ.

The starlings are represented by two species, possibly three, in the Manchurian Region. These are the grey starling (*Spodiopsar cineraceus*, Tem.), and the Daurian starlet (*Agropsar sturninus*, Pall.), both common in districts where they occur. The doubtful

species is a subspecies of the European starling which inhabits Siberia, and so may possibly occur in the Amur region, though I am unaware of its having been recorded. This is *Sturnus vulgaris poltaratskyi*, Finsch.

169. Grey Starling.

Spodiopsar cineraceus, (Temminck).

Sturnus cineraceus, Temminck, Pl. Col. p. 536, 1838, and T. and S. Faun. Jap. Av., p. 85, pl. 45, 1850.

The grey starling takes the place in these regions of the common starling in Great Britain, except that it does not build its nest in human habitation to anything like the same extent. It occurs in large flocks, sometimes containing hundreds, or even thousands, of individuals. It is one of the first birds to appear in spring, and spreads all over the country, nesting in holes in trees, or cliffs in the more secluded areas. It winters along the Yang-tzu Valley and throughout Central and Southern China. It has been recorded from the Ussuri by Poliakow, from South Manchuria by Bianchi, and from the Chin-wang Tao district by La Touche. It is extremely common throughout North China in the spring and autumn. I have also seen it nesting there.

It may be recognized by its general dark grey plumage; black crown, throat, and chest; white cheeks; orange bill; and yellow legs.

170. Daurian Starlet.

Agropsar sturninus (Pallas).

Gracula sturnina, Pallas, Reise Russ. Reich. III, p. 695, 1776.
Sturnus dauricus, Pallas, Act. Stock., III, p. 197, pl. 7, 1778.

This bird, which David says passes through North China and on into Mongolia in vast flocks, differs from the grey starling in being smaller, and in having a light grey head, neck, and breast, with shiny black upper parts, wings and tail, which have a fine purple sheen on the feathers. A buff band extends diagonally across the wing-coverts; the upper tail-covert is of a buff-brown; the primaries on their outer edges are a light brown; the bill and legs are black.

This bird occurs at least in Western Manchuria where it breeds. I have secured specimens in the Tientsin district, and have also met solitary individuals while travelling in Kansu.

It winters along the Yang-tzu, and in regions south of that river, where it may be seen in the reed beds in large flocks.

Family Laniidæ.

There are some seven species of shrikes or butcher-birds occurring in Eastern China, all of which have been recorded actually from, or close to, the Manchurian Region. Two are grey shrikes and are easily distinguishable from the others, which are red-backed shrikes and are not so easily distinguishable one from another. One of these, *Lanius bucephalus*, T. & S., has a grey tail, which serves to distinguish it from the others which have reddy-brown or chestnut-brown tails.

These four may be distinguished as follows:—

L. tigrinus, Drap. has a blue-grey head and nape, and a reddy-brown back.

L. cristatus cristatus, L. has the head brown with *no* light eye-brow.

L. c. lucionensis, L. has a white forehead, greyish head, and grey brown upper parts.

L. superciliosus, Lath. has a chestnut head and upper parts, with a white forehead, and white eye-brows.

171. Siberian Grey Shrike.

Lanius excubitor mollis, Eversmann.

Lanius mollis, Eversmann, Bull. Soc. Imp. Nat. Moscou XXVI, p. 498, 1853.

The Siberian grey shrike, the *Lanius major* of Pallas, and our next species the Chinese long-tailed grey shrike (*L. s. sphenocercus*), unlike the red-backed shrikes, are only partially migratory. Our present species is not a very common bird. I have seen a few specimens on the Lower Yang-tzu; while Mr. La Touche has secured it in the Chin-wang Tao district. It probably breeds at least in Northern Manchuria and the Amur.

It has the crown, nape, back and wing-coverts grey; light grey-white underparts, finely banded with black; a black band crosses the eye; the wings are black and white, as also is the tail;

the bill and legs are black. It has the upper and lower tail-coverts buff, instead of creamy greyish white or white, in which it differs from *L. e. borealis*, Vieill.

172. Chinese Long-tailed Grey Shrike.

Lanius sphenocercus sphenocercus, Cabanis.

Lanius sphenocercus, Cabanis, Journ. F. Ornith. p. 76, 1873.

This is the handsomest of the shrikes common to these parts. It differs from the Siberian grey shrike in being larger, in having a longer tail, in the absence of any barring or banding of the breast, and in having a greater amount of white on the wings, the coverts being white instead of grey, and the secondaries having a larger area of white. The white over the eye is more pronounced, extending posteriorly almost the whole length of the black band. In other respects it is like the Siberian species.

It is common, especially in winter on the plains of Central Shansi, and in North Shensi, where it may frequently be seen perched at the tops of solitary sorghum stems or young trees. I have seen a specimen taken in the Tientsin district; while La Touche twice records it amongst the migratory birds at Chin-wang Tao, on both occasion towards the end of March. It breeds in the Tung Ling district of Chihli, where I have seen young birds just taken from the nest. I have also seen similar young birds in Shansi, in the Shou-yang district near Tai-yuan Fu. La Touche also records this bird from the Yang-tzu Valley; while I saw a single specimen a little way to the south of Nanking. Jouy collected specimens in Central Corea in the latter half of November, and one on September 28th in 1883 near Seoul.

From these records it is safe to say that the bird occurs, and probably breeds, at least in South and South-western Manchuria, if not further north in Kirin and Heilungkiang. Indeed Hartert gives it as occurring in the Ussuri Region and Corea.

173. Thick-billed Shrike.

Lanius tigrinus, Drapiez.

Lanius tigrinus, Drapiez, Dect. Class. Hist. Nat. XIII, p. 523, 1828.

This bird is not very common in these parts though it undoubtedly occurs in the Manchurian Region. I secured specimens in neighbouring North China in the Tung Ling area of North-eastern Chihli during the breeding season.

It is a handsome bird, in which the crown and back of the head are blue-grey; the upper parts a rich ready-brown, lightly barred with black; the tail reddy-brown or chestnut; there is a black band through the eye; the throat white; under parts light buff.

174. Indian Red-tailed Shrike.

Lanius cristatus cristatus, L.

Lanius cristatus, L., Syst. Nat., I, p. 134, 1766.

This shrike appears to be extremely common in these parts. Ingram records it during the breeding season from the Khingan Mountains. I have secured large numbers in the Tientsin district during the migrations, both in spring (May) and in autumn (September). I secured two species of red-backed shrike in the Tung Ling (Hsin-lung Shan) area, namely *L. tigrinus*, and *L. bucephalus*, but not *cristatus*, from which facts it may be concluded that the birds passing through Tientsin were on their way to and from Manchuria.

This species may be recognized by its brown head and upper parts, there being no white eyebrow; the under parts are a light buffy-white.

175. Philippine Red-tailed Shrike.

Lanius cristatus lucionensis, L.

Lanius lucionensis, L., Syst. Nat., I, 135, No. 10, 1766.

The Philippine red-tailed shrike is another very common bird in these parts, though it appears to be more plentiful in Manchuria than in neighbouring North China. When on the Yalu River in May I saw large numbers of these birds, and collected many specimens. They were evidently on their way to their breeding grounds in Kirin and Heilungkiang. In the summer of 1913 I saw birds of this species breeding in the upper basin of the Sungari River, in Kirin; while Ingram records the species as occurring in the Khingan Mountains during the breeding season. Jouy collected specimens in Corea from May to July during the years 1884 and 1886, which shows that this bird not only breeds in that country, but probably passes through on migration.

Though *L. c. cristatus* is so common during the migrations in the Tientsin district, our present subspecies is comparatively rare there, for I secured only two specimens there, one in May and one in September. La Touche records it only once in three years at Chin-wang Tao, though in the spring of 1913 he records *L. superciliosus* almost every day from May 11th to June 2nd. It is obvious from all these records that our subspecies reaches Manchuria by way of Corea, and its probable route from the Philippines is by way of Formosa, the Lu-chiu Islands, Southern Japan, Corea, and Kirin to Heilungkiang; while the Indian bird, true *cristatus*, either crosses China to Eastern Chihli, and thence into Manchuria and to Heilungkiang by way of the Liao Valley, or else it follows the China Coast all the way to the Liao Valley.

L. c. lucionensis has the head grey, with white forehead, shading into grey-brown on the nape, back, wing-coverts and rump; the tail is less red, more brown, than in true *cristatus*, though it is far from being grey as in *L. bucephalus;* the usual black eye-band is present; the throat is white; the breast and lower parts buff, becoming almost light chestnut on the flanks.

The birds I saw on the Sungari had their nests in thick buskes, placed fairly high up and rather exposed. The young were partially fledged.

176. Japanese Red-tailed Shrike.

Lanius cristatus superciliosus, Latham.

Lanius superciliosus, Latham, Ind. Orn. Suppl. 20, No. 14, 1801.

Though no records of this bird's occurrence in the Manchurian Region exists, as far as I know, I include it in our list since it has been recorded by La Touche at Chin-wang Tao as being common during the migrations. It thus almost certainly occurs in South-western Manchuria, and as it breeds in North China it probably also breeds in neighbouring Manchuria.

It may be recognized at once by its rich chestnut-red head, back, wing-coverts, rump, and tail; its white forehead, eyebrows, and throat; characteristic black eye-band; and its buffy under parts.

177. Bull-headed Shrike.

Lanius bucephalus, T. & S.

Lanius bucephalus, T. & S., Fauna Japonica, Aves, pl. 14, 1850.

The bull-headed shrike, which, as already stated, differs from the other red-backed shrikes in having a grey tail, has the head nape and upper parts chestnut, with white eye-brows, the lower back grey; a white patch on the wing; breast and lower parts buff.

Mr. La Touche states in his paper on the Chin-wang Tao migrants that this bird was reported as passing Shan-hai Kuan, but was not seen at Chin-wang Tao.

This may seem somewhat slender grounds upon which to base the supposition that the species occurs in Manchuria, but since I saw what I took to be this species in the Upper Sungari basin, as well as the more common *L. lucionensis*, I include the bird in our list. In any case it occurs in East China as well as in the Northern parts of that country.

Family Campephagidæ.

The minivets, or caterpillar shrikes, are related to the true shrikes, but differ from them very markedly in general appearance. They are mostly brilliantly coloured birds, in which the male is of some bright shade of red and black, and the female is yellow and black, though some of the forms are of sombre colours, grey and white predominating. They all have rather long, wedge-shaped tails. Two forms occur in the Manchurian Region, where, doubtless, they breed.

178. Ashy Minivet.

Pericrocotus cinereus, Lafresnaye.

Pericrocotus cinereus, Lafresnaye, Rev. Zool. Vol. VIII, p. 94, 1845.

The ashy minivet passes commonly along the coasts of China, and also by way of Corea, on its way to Manchuria. I have secured specimens in the Tientisn district in May; while Ta Touche records it at Chin-wang Tao in May and early in June. Jouy collected some specimens in Corea, which Clark* described as belonging to

* Proc. U. S. Nat. Mus. Vol. 32, p. 474, 1907.

a new subspecies, *P. cinereus intermedius*, and it is possible that the form occurring in the Manchurian Region is referrable to this name, though the distinction seems to have been based on very doubtful and slender grounds.

Shrenck records *cinereus* from the Amur; and Taczanowski records it from Corea.

It has the head, nape, and upper parts a dark ashy-grey; the wings and tail grey-black; the forehead, sides of the neck, throat, and lower parts dirty greyish-white; the tail is long and wedge-shaped, the shorter feathers being white for the distal halves; the slightly hooked bill is black, as also are the feet and legs, which are small and weak. The bird is about 7½ inches in length.

179. Short-billed Minivet.

Pericrocotus brevirostris, (Vigors).

Muscipeta brevirostris, Vigors, Proc. Zool. Soc. Lond., 1831, p. 43.

In this beautiful species the male has the head, throat, neck, upper back, wing-coverts, ends of the quills, and the long middle tail feathers black; the rest of the plumage is of a bright vermilion. In the female a greyish-brown takes the place of the black, and yellow that of the vermilion, except that the forehead and throat are yellow.

I saw several flocks of these birds in the Tung Ling area of North-eastern Chihli during August and have heard their characteristic calls in the Manchurian forests.

The birds travelled about the forests in troops of from ten to twenty individuals, uttering a peculiar note, by which their presence might always be detected. They were very timid and restless, and I was unable to secure specimens.

Family Hirundinidæ.

This family is represented in Manchuria by a number of distinct species, and subspecies, of which two seem to be rather more prevalent and universally distributed than the others. These are the little sand martin, and the house martin.

As regards the true swallows, Manchuria appears to be a sort of summer meeting ground of a number of subspecies that winter in various more tropical countries, and it takes something more than observation from the window of a train (to which method of observation some of the records of Manchurian swallows are due) to tell which of the many forms, differing as they do but little from one another, occupies which particular district.

Thus of the genus *Hirundo*, though Ingram records no fewer than six subspecies, it appears, as he wisely remarks, that the races of *rustica*—four of which he records—are extremely doubtful.

I shall therefore content myself with giving but four well defined forms of *Hirundo*, which, with the house-martin, (*Chelidon*), and the sand-martin (*Riparia*), bring our list of the Manchurian *Hirundinidæ* up to six. La Touche's records of *Hirundo erythrogastra* and *Ptyonoprogne rupestris* at Chin-wang Tao are extemely doubtful.

180. Eastern House Swallow.

Hirundo rustica gutturalis, Scopoli.

Hirundo gutturalis, Scopoli, Del. Floret Faun. Insubr., II, p. 96, 1786.

I secured some swallows at Pei-tai Ho, about 24 miles from the Manchurian border, which have been referred to the above subspecies. These birds were breeding in the vicinity. The same form has been recorded by Ingram from the Khingan Mountains, La Touche at Chin-wang Tao, not far from Pei-tai Ho, and Jony from Corea, while Clark records it from Yeso Island. I saw it on the Yalu and elsewhere in Manchuria, though I did not secure specimens there. According to Hartert this is the form that breeds in the Amur, Ussuri, Manchuria, North China, Corea and Japan.

This form differs but little from true *rustica*. It is from ¾ of an inch to an inch shorter than *rustica*, being altogether a smaller bird.

It has the face and throat deep chestnut-red; crown, upper parts, chest, wings and tail black with a blue sheen; tail feathers spotted with white; breast and lower parts white; under tail-coverts slightly flecked with chestnut. The two outer tail feathers in the male are long and slender.

181. Tytler's House Swallow.

Hirundo rustica tytleri, Jerdon.

Hirundo tytleri, Jerdon, Birds of India, App. III, p. 876, 1864.

Ingram records this subspecies of the European *Hirundo rustica* from North-western Kirin; and Clark gives it as occurring at Petropaulski in Kamschatka. Hartert gives it as the form of *H. rustica* that breeds in North-east Siberia and Kamschatka, passing down the Kuril Islands and Japan to its winter resort in South China.

It is distinguished by having the under parts of a bright wine-red colour, with a broken chest-band of black, and the upper parts very purplish, more so than in the American barn swallow (*H. erythrogastra*), which has been reported, apparently wrongly, from this general region.

182. Hodgson's Red-rumped Swallow.

Hirundo daurica nipalensis, Hodgson.

Hirundo nipalensis, Hodgson, Journ. As. Soc. Beng., V, 1836, p. 780, 1837.

Some swallows secured by me on the Yalu River have been referred to this subspecies. La Touche records it from Chin-wang Tao. Hartert gives it as the form that breeds in China, Corea, and Japan; and it would seem also to occupy South Manchuria during the breeding season.

It has the crown, nape, upper back, wings and tail black, with a blue sheen; the sides and back of the neck chestnut; the lower back, and rump light chestnut, faintly lined with black; the throat and lower parts, including the under wing-coverts, buff, closely and neatly streaked with dark brown. There is no white on the tail feathers. This bird is larger than *H. rustica gutturalis*, but is under 7 inches in length.

183. Daurian Red-rumped Swallow.

Hirundo daurica daurica, L.

Hirundo daurica, L., Mantissa Plantorum, p. 528, 1771.

This form differs from the foregoing in having the dark streaks of the lower parts smaller and finer. It occupies Mongolia, Central and Northern Manchuria, the Amur and Ussuri Regions, as well as Eastern Siberia, Transbaikalia, and Kansu (North-west China).

In addition to these we have a record by La Touche of the American barn swallow (*H. erythrogastra*, Bodd.) as occurring at Chin-wang Tao. He does not appear to have secured an actual specimen, and it is probable that he mistook specimens of *H. rustica tytleri* for this form.

184. Oriental House Martin.

Chelidon urbica whiteleyi, Swinhoe.

Chelidon whiteleyi, Swinhoe, Proc. Zool. Soo. Lond. 1862, p. 320.

Ingram records *Chelidon urbica lagopoda* from the Khingans during the breeding season; while La Touche records *whiteleyi* once at Chin-wang Tao. I have seen a form of house martin nesting on cliffs in the mountainous regions of West Shansi, but did not secure specimens. These nests closely resemble those built by the house swallows, being attached to the under surfaces of overhanging rocks.

The head, mantle, wings and tail in this subspecies are of a blue-black, as in the European form; the throat, lower parts, and rump are white; the legs and feet are feathered white. It differs from true *urbica* of Europe in having the upper tail coverts pure white or only lightly spotted with black, and the tail less deeply forked.

185. Eastern Sand Martin.

Riparia riparia ijimæ (Lönnberg.)

Clivicola riparia ijimæ, Lönnberg, Journ. Coll. Sci. Tokyo, XXIII, Art. 14, p. 38, 1908.

At Fu-chin Hsien on the Sungari, near its junction with the Amur, I secured some specimens of sand martins, which were subsequently identified as belonging to Lönnberg's subspecies *Riparia riparia ijimæ*. These birds have the upper parts, including the wings and tail, of a dull dusky-brown, which colour extends on to the chests; the throat, lower parts and under tail-covert are of a dirty white.

My specimens were taken on August 16th, and were from large flocks that had gathered together. In 1912 I collected some sand martins on the Mongolian Plateau, north of Kalgan, Chihli, which were identified as *Riparia r. riparia*, L. This was on August 9th,

and these also were from large flocks. I have seen large numbers of sand martins flying about over the marshes in and round the Tientsin vicinity later in the year. La Touche records *Cotile riparia* as a spring migrant at Chin-wang Tao.

The same authority records the crag martin under the name *Ptyonoprogne rupestris** as breeding commonly in the mountains at Shan-hai Kuan; but Hartert gives Kansu as the easterly limit of the range of this form. I am unaware that any specimens have been taken in our region.

Family Regulidæ.

The gold-crests are represented amongst the birds of the Manchurian Region by a single species. They are a family of small birds not unlike the willow wrens, but characterized by having bright golden-orange or orange-red crests.

186. Japanese Gold-crest.

Regulus regulus japonensis, Blakiston.

Regulus japonensis, Blakiston, Ibis, 1862, p. 320.

This little bird, which is very rare in these parts, has the upper parts of an olive-green, with a bright golden-orange crest; the lower parts light greyish white. It is an inhabitant of wooded and forested areas.

Family Sylviidæ.

The *Sylviidæ* as a family are so well known as to need no description. They are practically all migrants that breed in north-temperate regions, and winter in south-temperate, or sub-tropical regions. They comprise the willow-wrens, or willow warblers, bush-warblers, grasshopper-warblers, reed-warblers, sedge-warblers, and white-throats, and by reason of their sombre colours, and the close similarity amongst many of the forms, are a difficult family to work out and observe. There are some 23 species and subspecies in our list.

187. Plumbous-legged Willow-Warbler.

Acanthopneuste nitidus plumbeitarsus, (Swinhoe).

Phyllopneuste plumbeitarsa, Swinhoe, Ibis, 1861, p. 330.

The willow-warblers are very difficult to identify when seen dodging about in the bushes and underbrush, or overhead in the taller trees, so that observations upon them made in the open with-

* *Hirundo rupestris*, Scopoli, Annus I, Historico-Nat. p. 167, 1769.

out collecting specimens should not be too strongly relied upon, unless carried out by a thoroughly trained and competent ornithologist. Our list of migrants that breed in the Manchurian Region contains some six species and subspecies, the largest of which is just under 6 inches in length, the smallest being only 3½ inches. They all have upper parts of a more or less rich olive-green, with whitish under parts suffused to a greater or lesser extent with yellow, grey, or green. They build dome-shaped nests of grass and moss close to the ground in tufts of grass and low shrubs.

Our first species, *Acanthopneuste nitidus plumbeitarsus*, may be recognized by its lead-coloured legs. Though this characteristic is not always very pronounced, the legs are always darker than in the other forms.

In size this bird is from 4 to 4½ inches. It is further characterized by the presence of a light cream-yellow bar through the eye, and another on the wing, the latter produced by the feathers of the secondary covert being light-tipped. Its pin-feather, or first flight-feather measures about 20 mm.

La Touche records it under the generic name *Phylloscopus* as passing through Chin-wang Tao; while Ingram's collectors secured specimens in the Khingans during the breeding season. I secured specimens on the Yalu River, and also in the Tientsin district.

188. Pale-legged Willow-Warbler.

Acanthopneuste tenellipes, (Swinhoe).

Phylloscopus tenellipes, Swinhoe, Ibis, 1860, p. 53.

This bird, which may be distinguished from the other willow-warblers by its greater size (La Touche gives 5.10 inches in his "Birds of North-west Fohkien"), and its pale pinkish legs, has been recorded by La Touche at Chin-wang Tao. It appears to be a regular summer visitor in the Manchurian Region.

189. Northern Willow-Warbler.

Acanthopneuste borealis borealis (Blasius).

Phyllopneuste borealis, Blasius, Naumannia, p. 313, 1858.

The northern willow-warbler is larger than the plumbous-legged willow-warbler, though it is not so large as the foregoing, measuring, as it does, just under 5 inches. It has the pin-feather only 13 mm. in length. Having the usual olive-green upper-parts, and pale lower parts, it also has light yellowish eye brows, but no light bar on the wing. The legs, too, are light.

I secured a specimen on the Yalu; while Ingram records it from Chu-chia-tai, North-western Kirin. La Touche observed it frequently at Chin-wang Tao.

Clark records *Acanthophneuste borealis xanthodryas*, Swinboe, the Arctic willow-warbler, from off the Kuril Islands, a specimen being taken on board the "Albatross" on October 1st, seven miles from land.

190. Temminck's Crowned Willow-Warbler.

Acanthopneuste occipitalis coronata, (T. & S.)

Ficedula coronata, T. & S., Fauna Japonica, Aves, p. 48, pl. 18, 1850.

La Touche records seeing three of these birds on May 16th, 1913 at Chin-wang Tao; while Clark states that Jouy's collection of Corean birds contains a specimen from Tsushima, six from Seoul, and three from Fusan. The Seoul birds were taken in the autumn from August to October, the others in spring in the month of May. It probably breeds in Corea. Ingram records it as breeding in the Khingan Mountains.

It may be distinguish from the others by its more greenish upper parts, and more pronounced light superciliary streak, which extends backwards well on to the nape. The crown is rather dark, with a distinct light greenish streak in the middle. This median streak is less pronounced than in the two following species. There is hardly any sign of a light bar on the wing. Bill, dark above, horn-coloured below; legs and feet light. Length about 4½ inches.

191. Yellow-browed Willow-Warbler.

Reguloides superciliosus superciliosus, (Gmelin.)

Motacilla superciliosa, Gmelin, Syst. Nat. I, p. 975, 1788.

This is a much smaller willow-warbler than any of the foregoing, and though of the same olive-green above, and light under parts as the rest, may be distinguished by its more distinct greenish-yellow eyebrows. There are also two yellowish bars on the wing.

La Touche records this bird at Chin-wang Tao as very common; Jouy's collection contains three specimens from Seoul, Corea; and Ingram records it is breeding in the Khingans. It breeds commonly in Siberia, and has been recorded as a straggler in Great Britain.

192. Pallas' Willow-Warbler.

Reguloides proregulus proregulus (Pallas).

Motacilla proregulus, Pallas, Zoogr. Rosso-Asiat. I, p. 499, 1881-31.

This little bird, the smallest of the willow-warblers, is of almost universal distribution in these parts. Ingram and La Touche both record it, the latter stating that it is common in the vicinity of Chin-wang Tao in spring. I have taken specimens in the Tientsin district.

It may be distinguished from the foregoing five forms by its having golden-yellow eye-brows, forehead, and stripe in the middle of the crown. Two bars are present on the wing, the anterior one being small and inconspicuous; while there is also a yellowish patch on the rump.

193. Brown Bush-Warbler.

Oreopneuste fuscata, (Blyth).

Phylloscopus fuscatus, Blyth, Journ. As. Soc. Beng., XI, p. 113, 1842.

Mr. La Touche records this little brown bird under the name *Herbivocula* at Chin-wang Tao; while Ingram gives it under the name *Phylloscopus* as breeding in the Khingans. I collected specimens in the Tientsin district: Bianchi records it from Ying-tzu (Newchwang), South Manchuria.

It is of a dark brown colour on the supper parts, including the wings and tail; whitish throat; buff eyebrous; and light buff lower parts, the chest being brownish; bill dark horn colour; legs lighter. It measures $4\frac{3}{4}$ inches in length.

In "The Austral Avian Record," Vol. III. No. 5. 1920 G. M. Mathews and T. Iredale give a new generic name, *Phœorhadina*, to this bird.

194. Radde's Bush-Warbler.

Herbivocula schwarzi, (Radde.)

Sylvia (*Phyllopneuste*) *schwarzi*, Radde, Reise Süden von Ost-Sib., II, 1863, p. 260, pl. 9.

Hardly distinguishable at a distance from the brown bush-warbler, this bird may, nevertheless, be recognized, when closely examined, by the presence of only a short buff eyebrow, the slightly

more olivceous tinge of its plumage, and whiter throat and lower parts in the male, the lower parts in the female being yellowish. It is somewhat larger than *fuscata*, being 5½ inches in length; and is of a more slender build; the bill and legs are light brown, the former being much shorter and stouter than in *fuscata*.

Both La Touche and Ingram record it, the former from Chinwang Tao, where it seems to be less common than the brown bush-warbler, the latter under the name of *Lusciniola* from the Khingans during the breeding season. Taczanowski records it from Corea. I secured specimens in the forest near I-mien-p'o, North Kirin, during September. It seemed fairly plentiful at that time, and had, I believe, been breeding in the district. I have also secured it in the Tientsin district during the migrations (May 23rd, 1917).

195. Swinhoe's Bush-Warbler.

Horornis cantans borealis, (Campbell.)

Cettia minuta borealis, Campbell, Ibis, 1892, p. 235.

This is the *Horornis canturians* of Swinhoe. I found this beautiful songster very common in the Upper Sungari basin, and also on the Yalu, though on account of its excessive shyness at the approach of a human being, only managed to secure one specimen. It could be seen sitting out on some exposed branch, generally at a good height above the ground, pouring forth its rich music; but it never allowed me to approach. At other times it could be heard in the bushes but not seen. As it was fairly common on the Upper Sungari in the middle of the summer, we may take it that it was breeding there, though I failed to find its nest.

Jouy's collection contains one specimen taken at Seoul in October, reported by Clark under the name of *Cettia canturians*, Swinhoe. The same collection contains a specimen of a bush warbler named *Cettia cantans*, T. and S., of which our present form appears to be a subspecies. There seems to be a certain amount of confusion in regard to the nomenclature of our speeces.

Of a fine light brown colour on the bead, back, wings, and tail, with the throat, breast and lower parts of a light buff-white, this bird is a good deal larger than either of the foregoing bush-warblers. In appearance it approaches more nearly to Pallas' thrick-billed warbler (*Pragmaticola aëdon*), formerly known as *Arundinax aëdon*, and to the Eastern great reed-warbler (*Acrocephalus arun-*

dinaceus orientalis, T. and S.,) both of which birds are very much the same colour, and when seen at a distance might be confused with each other, and with our present species. *Phragmaticola aëdon*, even, occupies much the same spots being more of a bush-inhabiting form. *A. a. orientalis* keeps to reed and osier beds almost exclusively, and is excessively noisy, its harsh, chattering notes being very different from the sweet liquid ones of *H. c. borealis*. It also is larger and has a longer bill, nor is the brown of its back of so warm a tone. *P. aëdon*, though about the same size as *H. c. borealis*, has a thicker, heavier bill, and is about the same colour as *A. a. orientalis*. I have not noticed its song; and, apparently, it is a fairly silent bird, while the other two are always warbling.

The chief peculiarity about our bush-warbler is the unusual fullness of the throat, the skin of this area being very loose, and capable of being swelled out to an unusual degree, even for a songster. Doubtless this accounts for the extraordinary resonance and power of its song, which, commencing low down in the scale, resembles the sound of a deep jug being filled with water from a tap, but it is more musical, and is without the splashing sound. It runs slowly up the scale, ending in a high pitched trill. It is repeated at frequent intervals, and can be heard for a considerable distance. The bird also makes another kind of noise as it hops about in the underbrush, which resembles nothing so much as the *dick dock, dick dock* of a large clock.

196. Short-tailed Bush-Warbler.

Urosphena squameiceps, (Swinhoe).

Tribura squameiceps, Swinhoe, Proc. Zool Soc. Lond, 1863, June 23, p. 292.

This small warbler is about the size of a wren, which makes it the smallest of the bush-warblers. It has the upper parts of a rich brownish colour, with a tint of chestnut and olive: the head is squamated, or scaled, in appearance; there is a well defined cream-white eye-brow; the lower parts are buffy-white. It has a very short tail. I am not aware of its having been reported from the Manchurian Regian, but since it occurs in North-eastern China, it probably also occurs in Manchuria, and doubtless breeds there.

197. Baikal Grass-Warbler.

Tribura tacsanowskia, (Swinhoe).

Locustella Tacsanowskia, Swinhoe, Proc. Zool. Soc. Lond. 1871, p. 355.

The Baikal grass-warbler is a small bird with plain dark olive-brown upper parts; paler on the under parts (yellowish in immature specimens); a slight light band passes through the eye; the tail is short and wedge-shaped. It differs from the other small warblers in being much darker above, and in having shorter wings and bill.

This bird certainly passes through Manchuria during the migrations, and probably many individuals stop there to breed.

198. Chinese Marsh-Warbler.

Lusciniola sinensis, Witherby.

Lusciniola sinensis, Witherby, Bull. Brit. Orn. Club., No. CLXXXII, Vol. XXXI, p. 11, Nov. 28, 1912.

This warbler has a very short bill; the upper parts are brown, strongly striped with black; the lower parts whitish, with bright buff flanks; the tail is long, much graduated; legs and bill are of a pale flesh colour.

Specimens of this bird have been taken at Chin-wan Tao by Mr. La Touche, hence it probably occurs and breeds also in Manchuria.

199. Gray's Grasshopper-Warbler.

Locustella fasciolata, (Gray).

Acrocephalus fasciolata, Gray, Proc. Zool. Soc. Lond. 1860, p. 349.

This grasshopper-warbler is larger than the foregoing, being a rather large bird. It is plain dark brown above, richer on the wings; lighter below, but not so light as in most warblers; the flanks are the same as the back; under tail-covert a buff-brown; tail wedge-shaped; very slight eyebrows; light throat; bill dark brown; legs light horn colour. Its length is about 6¾ inches.

Ingram records this bird as breeding in the Khingan Mountains; while Taczanowski records it from Corea. It winters in the Malay Archipelago.

200. Middendorff's Grasshopper-Warbler.

Locustella ochotensis, (Middendorff).

Sylvia (*Locustella*) *ochotensis*, Middendorff, Sib. Reise II, 2, p. 185, Taf. XVI, fig. 7, 1853.

Middendorff's grasshopper-warbler is of medium size. In it the upper parts are a rather dark brownish colour, only very slightly streaked with a darker shade of brown; while the light underparts are plain. Its bill and legs are as in *Locutella fasciolata*. Its length is 5½ inches.

Middendorff's discovery of this species mark it as a bird that inhabits at least the eastern parts of the Manchurian Region.

201. Pallas' Grasshopper-Warbler.

Locustella certhiola, (Pallas).

Motacilla certhiola, Pallas, Zoogr., 1, p. 509, 1811-31.

I secured specimens of this grasshopper warbler in the lower reaches of the Sungari River, near its junction with the Amur, where the bird was comparatively common in the low-lying half-swamped fields. I also saw it on the Yalu, and in other parts of Manchuria; while migrants crossing the Pechili Gulf frequently settled on my steamer while I was travelling from Antung at the mouth of the Yalu to Tientsin. This was as late as June. Ingram records noting it on a steamer travelling between Japan and Vladivostok. La Touche records it as common at Chin-wang Tao from late in May to the middle of June.

I secured specimens also in the Tientsin district May 25th and 31st, June 1st to 10th, and September 7th and 10th. These dates show the bird to be a very late arrival in these parts. The birds I saw on the Lower Sungar had evidently been breeding there, for the young were still with their parents. This was about the the middle of August.

The head, neck, back, and wings in this bird are of a dark brown, the feathers having black centre-steaks; the upper tail-covert is slightly lighter and more reddish; the tail is brown, with lighter tips, and is strongly graduated, or wedgeshoped; the throat and under parts are buff-white, with a distinct yellow washing on the throat and breast, and a deep buff on the chest, flanks, and under tail-covert. The bird is of medium size.

202. Streaked Grasshopper-Warbler.

Locustella lanceolata, (Temminck).

Sylvia lanceolata, Temminck, Man. d'Orn. IV, p.)14, 1835.

The streaked grasshopper-warbler, as its name suggests, may be recognized by its being more streaked than any of the others. It is of a greyish-brown, heavily streaked on the upper parts with black; whitish on the lower parts, streaked on the chest and under tail-covert with brown. Its length is from $4\frac{3}{4}$ to 5 inches.

It is known to breed throughout Siberia. Ingram records it in the Khingans during the breeding season, while La Touche records it as a migrant at Chin-wang Tao. I secured specimens in the Tientsin district on May 27th, and June 1st to 9th. Whether it breeds in the latter area or not has not been ascertained; though I am inclined to think it does. If not, then it is an extremely late migrant.

203. Thick-billed Warbler.

Phragmaticola aëdon, (Pallas).

Muscicapa aëdon, Pallas, Reis. Russ. Reich. III, p. 695, No. 11. 1776.

I secured a single specimen of this warbler on the Sungari, near its junction with the Amur, in August, 1915, the species apparently breeding there. Another specimen was secured by me in the Tientsin district on May 28. Ingram records it from the Khingans, and La Touche as a migrant at Chin-wang Tao.

As already stated it is very much like the Eastern great reed-warbler (*Acrocephalus arundinaceus orientalis*), from which it may be distinguished by its slightly smaller size, and shorter and thicker bill. It may be described as light olive-brown above, light buff below, with a white throat, and with no streaking or other marks on its plumage; bill and legs of horn colour, the former rather short and thick; tail slightly wedge-shaped. Length about $7\frac{1}{4}$ inches.

This was the bird I saw breding on the low hills of the Upper Sungari basin; and though I found its nest, I did not secure any eggs. The nest is built of grass, being fastened to the stems of the bushes, a foot or two above the ground.

204. Eastern Great Reed-Warbler.

Acrocephalus arundinaceus orientalis, (T. & S.)

Salicaria turdina orientalis, T. & S., Fauna Japonica, Aves, p. 50, pl. 20, 1850.

This is the largest of the warblers in these parts, and is also by far the commonest. It breeds throughout North China and Western, Southern, and Central Manchuria, wherever suitable conditions offer, *i.e.* reed and osier-beds along streams, rivers, canals or round marshes. North of Harbin in Manchuria it is not at all common though ideal conditions are offered. Ingram records it as breeding in Northern Manchuria, however. Jouy's collection contains specimens from Corea; while La Touche records it from Chinwang Tao. I secured specimens on the Yalu, and also in the Tientsin district, in both of which places it breeds freely.

The head, neck, back, wings, and tail are of a dull brown colour; the throat, chest, and lower parts are buff-white, the chest and lower throat inclined to be lightly streaked; there is a faint eyebrow of buff; the bill is long, strong, and of a brown colour; the legs are long, the feet strong, and of the same colour as the bill; the tail is wedge-shaped.

This bird builds its nest either in the tall reeds, or else in low willows at no great height from the ground; always in the neighbourhood of water. It has a loud, not very musical, chattering sort of song, in which it indulges incessantly, commencing very early in the morning and continuing long after dusk.

205. Shrenck's Reed-Warbler.

Acrocephalus bistrigiceps, (Swinhoe).

Calamoherpe bistrigiceps, Swinhoe, Ibis, 1860, (Jan.), p. 51.

This little warbler, which was first described by Swinhoe in January, 1860, was later in the same year described by Schrenck from the Amur under the name *Calamodyte maackii*.

It is of an olive-brown above, light buffy white below; it has a double eyebrow of light buff, surmounted with black, the crown being slightly streaked; the back and upper parts are plain; bill dark above, light below; legs horn colour. Its length is 5 inches.

Swinhoe described it from Amoy, Ingram records it from Northern Manchuria; Bianchi from Southern Manchuria; La Touche from Chin-wang Tao, where it is very common from the middle or end of May to the middle of June. I secured a series of specimens in the Tientsin district from May 14th to June 9th.

206. La Touche's Reed-Warbler.

Acrocephalus tangorum, La Touche.

Acrocephalus tangorum, La Touche, Bull. Brit. Orn. Club. No. CLXXXII, Vol. XXXI, Nov. 28, 1912, p. 10.

Taken and described by La Touche at Chin-wang Tao, where it was discovered, this little reed-warbler doubtless occurs, and breeds in Manchuria.

It has the upper parts brown; lower parts lighter, washed with bright rufous-buff; it has a dark band above the pale superciliary stripe, in which particular it differs from *A. agricola*, Jerd. Its size is about as in *bistrigiceps*.

207. Indian Sedge-Warbler.

Acrocephalus agricola, (Jerdon).

Sylvia (*Acrocephalus*) *agricola*, Jerdon, Madr. Journ., XIII, pt. 2, p. 131, 1845.

The Indian sedge-warbler is a slightly larger bird than the foregoing, and is of a plain olive-brown above; white throat, chest, and breast; buff flanks; and only a slight light eyebrow, with no black band above it.

La Touche has secured the bird at Shan-hai Kuan, and it undoubtedly occurs in Manchuria.

I secured a specimen of sedge-warbler in the forested area of the Tung Ling (Hsin-lung Shan), North-eastern Chihli, which has been referred to *Anteliocichla agricola concinens*, Swinhoe, (*Acrocephalus a. concinens*, Hartert, Vögel pal. Fauna, I, p. 565), and it is possible that this is the form that occurs in these parts, and not true *agricola*, though, of course, both may occur together.

208. Chinese Sedge-Warbler.

Acrocephalus sorgophilus, Swinhoe.

Calamodyta sorgophilus, Swinhoe, Proc. Zool. Soc. Lond. 1863, p. 92.

This is a small bird with double eyebrows, light below and black above much as in *bistrigiceps* and *tangorum*, from which it differs in being streaked on the upper parts, though agreeing in general colour and size.

It has been recorded as not very common at Chin-wang Tao by La Touche.

209. Lesser White-throat.

Sylvia curruca affinis, Blyth.

Sylvia affinis, Blyth, Journ. Asiat. Soc. Bengal, XIV, 1845, p. 564.

The white-throat may at once be recognized by its slaty-grey upper parts, suffused with brown on the back; the wings being brown, edged with grey; the tail dusky; the under parts are white, the breast being faintly tinged with pink in the male; the ear-coverts are conspicuous and of a dark brown colour, almost black. The length of the bird is 5¼ inches. Though not hithertoo recorded from the Manchurian Regions it almost certainly occurs there for it is well known in neighbouring North China.

Its winter home is India and neighbouring regions.

Family Prunellidæ.

Two members of this family occur in our region, one of which the Chinese alpine accentor (*Prunella collaris erythropygius*) has been dealt with under the permanent residents; the other, the Chinese hedge-sparrow (*P. montanella*), being a true migrant comes next in our list.

210. Chinese Hedge-Sparrow.

Prunella montanella, (Pallas).

Motacilla montanella, Pallas, Russ. Reichs. II, I, p. 695, 1776.

This little bird passes through the Tientsin district during the migrations. I have secured it early in April and during the first half of November. It is strange that none of the authorities quoted

in connection with the birds of the Manchurian Region record this bird; yet since it occurs in North-eastern Chihli, it must certainly occur also at least in South-western Manchuria. I have met with it throughout the mountainous regions of North China, where it breeds. The migrants passing through Tientsin probably breed in the mountains of North and North-eastern Chihli.

It is about the same size as the British hedgesparrow (*Prunella modularis*), but differs markedly in its plumage. It has the head black, with long, pronounced, buff-coloured eyebrows; buff throat, cheeks and chest, the feathers of the latter having their centres occupied with black, which shows as little crescent-shaped spots on the breast; the rest of the lower parts are a very light buffy-white; the mantle a dark chestnut, more vinous on the back and wings, all the feathers having a darker centre, and those of the secondary coverts being tipped with buff-white; lower back and tail brown; the bill is black; the legs and feet light brown.

Family Turdidæ.

The large family *Turdidæ*, which includes the thrushes, chats, and robins, is the next for our consideration. The birds of this family are almost without exception migratory. In common with the warblers and fly catchers they are soft-billed birds, and they depend to a large extent upon an insect diet, though many of them eat a considerable amount of fruit in the way of wild berries.

211. Whites' Ground-Thrush.

Oreocincla dauma aurea, (Holandre).

Turdus aureus, Holandre, Fauna dép, Moselle, p. 60, 1825 and 1836.

Turdus varius, Pallas, Zoogr. I, p. 449, sp. 48, 1811-1331.

A common bird in China and Japan this bird finds its way into the Manchurian Region, if not further north into Siberia, to breed. Jouy collected specimens at Fusan in Corea on April 22nd, 1886. It winters in South and South-eastern China, and in Formosa.

It is a large, handsome thrush of a general golden-olive above, whitish below, each feather, above and below, terminating in a black band, which gives a scaly appearance. The throat, belly and under-tail coverts are unmarked; the chest and breast are tinged with golden-buff; the primaries and tail are plain, and are more of an olivaceous-brown; bill and legs horn-brown. The bird is a good deal larger than most of the thrushes.

212. Siberian Ground-Thrush.

Cichloselys sibiricus sibiricus, (Pallas).

Turdus sibiricus, Pallas, Reis. Russ. Reich , III, p. 694, No. 10, 1776.

I secured a specimen of this bird on the Yalu River on May 24th, 1914; while La Touche records it at Chin-wang Tao once in May, 1912, and Twice in May, 1913. Jouy's collection contains a specimen taken at Fusan on May 7th, 1884, and another on September 28th the following year. It has also been recorded from Ying-k'ou (Newchwang) in South Manchuria, where Captain Karpow secured a specimen on May 10th, 1901.

Of a general dark slate-grey, this bird has a conspicuous white eye-brow, a white spot on the lower breast, and a larger white patch on the belly, the tips of the feathers of the under tail-covert also being white; the outer tail feathers are tipped with white, the outermost pair having more white than the others; the under surface of the wing is whitish; while the flight feathers each have a white, or buff, patch on the inner web; the bill and legs are horn coloured. The bird is about the size of the British song thrush.

213. Grey-backed Ouzel.

Turdus hortulorum, Sclater,

Turdus hortulorum, Sclater, Ibis, 1863, p. 196.

This is not at all a common bird in these parts. La Touche records seeing three on April 29, and May 1st, 1911, at Chin-wang Tao, which are the only records I can find to justify its inclusion amongst the summer visitors of the Manchurian Region.

It may be recognized by its dusky-grey back and upper parts, and its orange flanks; the lower parts are white, with a pectoral band of grey, spotted in the female on the throat and chest with black, and only faintly spotted in the male with grey. It is rather a large thrush, being about the size of the British missle-thrush.

214. Red-tailed Ouzel.

Turdus naumanni, Temminck.

Turdus naumanni, Temminck, Man d'Orn. I, p. 170, 1820, and Ibis, 1862, p. 319, pl. X.

The commonest of all the ouzels or thrushes of these parts is the red-tailed ouzel. It is the only member of the family *Turdidæ*

that stops in Manchuria and North China during the winter, though it is also to a considerable extent migratory. It may be found in winter in the mountainous areas of South and South-western Manchuria and of North China throughout the entire winter, living upon such wild berries as occur. Ingram records it as being taken in Central Manchuria by James on November 19th, 1886. I secured a specimen, and saw many others, in the mountains of the Tung Ling area in North-eastern Chihli in January, and I have also seen it many times in the high mountains of West Shansi in the middle of winter. Jouy secured a single specimen at Fusan, Corea, on January 3rd.

The crown, nape, back, and wings are of a dusky brown; there is a light reddy-buff eyebrow; while the throat, breast, and belly are of a chestnut colour flecked with white, a row of dusky spots occurring on either side of the throat in the male, more pronounced and extending on to the chest in the female, which also has the throat white, and more white on the lower parts; the tail in the male is a rich chestnut-red, in the female it is more inclined to brown. In size this bird is about as in the grey-backed ouzel, perhaps a little smaller.

215. Pale-flanked Ouzel.

Turdus pallidus, Gmelin.

Turdus pallidus, Gmelin, Syst. Nat. p. 815, No. 45, 1788.

Easily recognized by its pale flanks, which are buff instead of orange, as in *Turdus hortulorum*, and its brown upper parts, this thrush has been recorded by Clark from Fusan in Corea, some five specimens having been collected by Jouy on April 25th, 28th and 29th, 1884. Taczanowski records it from the Ussuri. James secured some fledglings in the valley of the Sungari near its source (Hsiao Shan Forest), from which it may be concluded that the bird breeds in Manchuria. It appears to winter in Japan and South-eastern China. Schrenck records this bird from the Amur under the synonym *T. daulias*, Tem.

The head, upper parts, wings, and tail are brown; the chest and flanks pale olive-brown; the lower parts, and tips of the two outer tail feathers white.

216. Japanese Ouzel.

Turdus chrysolaus, Temminck.

Turdus chrysolaus, Temminck, Pl. Col. 537, 1838, and, T. & S., Fauna Japonica, Aves. p. 64. pl. 28, 1850.

Being a Japanese bird this thrush finds its way into the Manchurian Region to breed. We find it recorded as having been collected by Jouy on May 3rd and 7th 1884; while Schrenck records it from the Amur. Swinhoe also states that it spends the summer in the Amur.

This bird may be distinguished from *Turdus hortulorum*, which it somewhat resembles, by its brown instead of dusky-grey upper parts, its grey throat, its chestnut-orange flanks *and* chest, white throat, breast and under tail-covert, and much less spotted throat and chest.

217. Red-necked Ourzel.

Turdus ruficollis ruficollis, Pallas.

Turdus ruficollis, Pallas, Reis. Russ. Reich. III, p. 694, 1776-78.

This species differs from *Turdus naumanni*, which it resembles, in having a greater amount of the rich chestnut-red on the breast, throat, cheeks and sides of the neck, which colour ends abruptly on the lower breast, below which the plumage is white; there is no white flecking on the chest and throat, nor are there any dark spots, except in the female. The upper parts are like those of *naumanni*, the rump and tail being chestnut-red.

This bird is common in Shansi and westward, but apparently is not so well known in North-eastern China and Manchuria, where, however, it does occur.

218. Dusky Ouzel.

Turdus eunomus, Temminck.

Turdus eunomus, Temminck, Pl. Col., 514, 1838.

Turdus fuscatus, Pallas, Zoogr. I. p. 451. pl. XII, 1811-31.

I encountered this thrush in the I-mien-p'o forest district of North Kirin during the autumn migrations in great numbers. The species, which is the *T. dubius*, and *T. fuscatus* of authors,

breeds in Northern Manchuria, the Amur, and in Siberia. It is no exaggeration to say that I saw thousands of these birds, for during the first part of October they seemed to be passing southward in one continuous stream all day. The last was seen on the 14th and a cold north wind blew on the 15th., after which the weather turned noticeably colder.

Under the name *Merula fuscata*, La Touche records this bird as passing through Chin-wang Tao almost daily from March till the end of May. Jouy secured a pair at Fusan, Corea, in the middle of March; while Ingram records it under the name of *T. dubius*, Bechstein, from the Khingan Mountains in May, and states that Pophan was the first to collect the eggs of this bird in 1875 in the valley of the Yenesei. Poliakow records it from the Ussuri region under the same name.

This bird may be recognized at once by its very much darker plumage than in any of the foregoing, the crown, upper back, and chest-band being almost black, the rest of the upper parts being of a dark, dusky-brown, merging into chestnut on the wings; the flight feathers are of a blackish-brown; the tail blackish-brown; there is a distinct buff or buff-white eyebrow; the throat and cheeks are buff-white; the ear-coverts blackish; the breast is a creamy-white, spotted with dusky. The female is altogether more dusky with less reddish brown on the wings. The bill and legs are blackish. Size about as in *T. naumanni*.

219. Grey-headed Ouzel.

Turdus obscurus, Gmelin.

Turdus obscurus, Gmelin, Syst. Nat. p. 816, No. 48, 1788.

Jouy secured a single specimen of this species at Fusan in May. La Touche records it at Chin-wang Tao from May 3rd to June 2nd, Taczanowski records it from the Ussuri, and Bianchi from South Manchuria.

It may be recognized by its grey head and throat, with white eyebrows, and chin, olive-brown back, and dull brownish-orange flanks and chest, the lower parts being white.

220. Common Rock-Thrush.

Monticola saxatilis, (Brisson).

Merula saxatilis, Brisson, Orn. II, pp. 238, and 240, 1760.

Turdus saxatilis, L., Syst. Nat., I. p. 249, 1766.

This well known species of rock-thrush is common in the mountains of North China during the warmer months; its range probably extending into South and South-western Manchuria.

The head, neck, throat, back, and wings are a greyish-blue, with a white patch on the back, and black on the scapulars; the rump and tail are a light chestnut-red; the under parts are rufous.

The bird nests in holes and crevices in cliffs, or on ledges at a considerable height above the ground.

221. White-throated Rock-Thrush.

Petrophila gularis, (Swinhoe).

Orocetes gularis, Swinhoe, Proc. Zool. Soc. Lond, p. 318, 1862.

This handsome bird appears to be of fairly common occurrence both in North-eastern China and in Manchuria, for it has been recorded a number of times, namely: by Indram in the Khingans (May 28th and 29th), Bianchi from Ying-kou, South Manchuria, (May 14th), La Touche in May at Chin-wang Tao; while I have secured it in the Tientsin district in May and June, and in the Tung Ling (Hsin-lung Shan) area on August 8th.

It is very different in plumage from the foregoing. The crown and nape are of a fine steely-blue; the the cheeks, mantle, upper back, and wings are black, the lesser coverts of the wing being of the same blue as the head, and a white patch occurring on the secondaries; the face (exclusive of the forehead), throat, sides of neck, chest, lower back, and tail-coverts are a dark rufous or chestnut-red, fading into a more orange colour on the breast and belly; the tail is dusky washed faintly with steel-blue; the middle of the throat is white. In size it is considerably smaller than any of the foregoing thrushes.

222. Red-bellied Rock-Thrush.

Petrophila solitaria philippensis, (Müller.)

Turdus philippensis, Müller, Natursystem, Anhang, p. 142, 1776.

Merula solitaria philippensis, Brisson, Orn. II, p. 272, No. 32. 1760.

This, the *P. manilla* or *P. manillensis* of authors, is another of the Eastern China rock-thrushes that appears to be rather common. This species is known to breed in the mountains of Northeastern Chihli. My collector secured specimens in the hills to the north of Pei-tai Ho, and Chin-wang Tao, close to the Manchurian border. La Touch records it at Chin-wang Tao; while Clark says it is not uncommon on Matsushima, in the Japan Sea. It is larger than *Petrophila gularis*, measuring from 8½ to 9 inches. Its plumage consists of but three colours. The head, neck, thoat, breast, back, scapulars, lower back, upper tail-covert and thighs are of a steel-blue, somewhat darker than the blue in *P. gularis;* the wings and tail are black, edged with blue; while the breast, belly, flanks, and under tail-covert are a deep chestnut-red; the bill and legs are black.

The immmature plumage, and that of the females in this and the foregoing, are so different from that of the adult male, as to call for description. The whole plumage is a dusky olive-brown, lightly barred with buff. The females, and immature males of these two species may be distinguished by the difference in their size, *P. gularis* being the smaller.

In a recent paper* La Touche describes a larger form of this bird under the name *Petrophila solitaria magna*, as inhabiting China, Formosa and the Pescadores Islands, and suggests that it breeds in Eastern Siberia.

223. Siberian Wheatear.

Oenanthe pleschanka pleschanka, (Lepechin).

Motacilla Pleschanka, Lepechin, Nov. Comm. Petr., Vol.XIV, p. 503, pl. XXIV, 1770.

Motacilla leucomela, Pallas, Nov. Comm. Petr., Vol. XIV, p. 584, pl. XXII, fig. 3, 1770.

The wheatear that occurs in the Manchurian Region is undoubtly the above named species, the only question in dispute

*Bull. B.O.C., Vol. XL, p. 96-97, 1920.

regarding it being the correct name to assign to it. Hartert uses Lepechin's *pleschanka*, but in "A List of British Birds," compiled by a committee of the British Ornithologists, Union (1915, p. 370 Appendix) Pallas' name *leucomela* is adopted, the reason given being that Lepechin's names "are not consistantly binomial." The name *Pleschanka* was given, apparently, as the local Russian name for the bird. A later name, and one that has been much used, is Hemprich and Ehrenberg's *moria*.

The species ranges from European Russia across Central Asia and Siberia into Mongolia, North China, and Manchuria.

This wheatear has the crown and nape, lower back, rump, upper and lower tail coverts, basal portions of the retrices, lower breast and belly white, the crown and nape often washed with smoky grey: the face, cheeks, throat, upper breast, mantle, wings, and terminal parts of the retrices black, sometimes lightly pencilled with brown. The female is brown, having the lower parts considerably lighter than the upper parts, and only the lower back, rump, tail coverts, and basal part of retrices white. Bill and legs black. Length 6 inches.

The wheatears that breed in Mongolia and adjacent more or less arid areas, make their nests in holes in the ground, often sharing the burrows of the susliks (*Citellus*), and pikas (*Ochotona*.)

224. Eastern Stonechat.

Saxicola torquata stejnegeri, (Parrot).

Pratincola rubicola stejnegeri, Parrot, Verh. Orn. Ges. Bayern, VIII, p. 124, 1908.

In corresponding with me in connection with the identification of a stonechat secured by me in South-western Shensi, Mr. La Touche pointed out that it was a good deal larger than the more eastern birds. However, my specimens from Shensi, as well as others that I secured in the I-mien-p'o district of North Kirin, and in Tientsin have been referred by Mr. Riley to Parrot's form *stejnegeri*, and not to Pallas' *maura*, the name adopted by La Touche in his notes on the emigrants at Chin-wang Tao (Ibis, 1913).

A comparison of two male specimens, one from Tientsin, and the other from Shensi, show the Shensi bird to be nearly an inch longer than the Tientsin bird. Allowing for differences due to

imperfect preparation of the two skins, there can be little doubt that the western bird is the larger. It is possible that Pallas' species is represented by the larger, western form and Parrot's by the smaller eastern one.

Ingram records *P. maura* from the Khingan Mountains; while Clark reports *stejnegeri* from Corea, in Jouy's collection.

Our bird has the head, throat, cheeks, nape, back, wings, and tail black; the sides of the neck, a patch on the basal part of the secondaries, and the upper tail-covert white; the chest a rich chestnut-red, fading into buffy-chestnut on the breast and lower parts; back and mantle brown, slightly speckled; bill and legs blackish.

225. Blue-tailed Bluestart.

Ianthia cyanura, (Pallas.)

Motacilla cyanura, Pallas, Reis. Russ. Reich. II, app. p. 709, 1776.

In the male of this pretty little species the crown, nape, cheeks, sides of neck, sides of chest, mantle, back, wings, and tail are of a dark grey, richly washed with blue; the eyebrows, throat, middle of chest, breast, and lower parts are a dirty white; the flanks are a rich orange-chestnut, or rufous colour; bill and legs dark blackish-brown. In the female the upper parts are of a dark olive-brown, the tail and rump being washed with blue; the under parts are washed with olive-grey, the flanks showing a wash of rufous. In immature birds the plumage is like that of the female, but without the rufous flanks, and with even less blue on the tail.

It is a very common species in these regions. Ingram records it in the Khingans on June 6th and 8th, under the generic name *Nemura*. La Touche records it a great many times at Chin-wang Tao; while Jouy's collection contains two specimens from Corea. I have secured many specimens, and seen it frequently in the Tientsin district, and in other parts of North China.

226. Daurian Redsart.

Phœnicurus auroreus auroreus, (Pallas).

Motacilla aurorea, Pallas, Zoogr. Ross.-As. I, p. 477, 1811-31.

One of the first birds to appear in the spring in these parts is the Daurian redstart, which may easily be recognized by its distinctive colouring. The crown and nape are a fine light ashy grey, and there are two large white patches on the wings; the

rest of the upper parts, including the throat and chest are black; the breast, under parts, lower back, rump and tail are a fine rusty-red colour. In the female the plumage is a dull brown, with a white patch on each wing, and the tail rusty-red, but not so intense as in the male.

It is very common in these parts. I encountered a great many on the Yalu in the spring and early summer of 1914, where it was breeding.

It builds its nest in holes in walls, crevices in rocky cliffs, or even in holes in trees, the nest consisting of dried grass, horse-hair, moss, and, when procurable, sheep's wool.

The bird breeds throughout North China.

La Touche records a single specimen of the plumbeous water redstart (*Rhyacornis fuliginosa*, Vigors),* at Chin-wang Tao.

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227. Kamschatkan Ruby-throat.

Calliope calliope camtschatkensis, (Gmelin.)

Turdus camtchatkensis, Gwelin, Syst. Nat. I. p. 817, 1788.

This handsome bird may be recognized at once by its beautiful vermilion throat and gorget, which in the full plumage is lined with black and slate-grey merging into grey-brown on the chest. The tips of the vermilion feathers are white, which gives the throat a scaled appearance. The breast is brownish-white, the rest of the plumage, with the exception of the white eyebrows and mustache-streaks, is of a dark olive brown. In the female and immature males the ruby or vermilion of the throat is absent.

This bird appears in large numbers, during both the spring and autumn migrations, throughout North China and the Manchurian Region. It arrives in spring about the beginning of May. Strangely enough, La Touche records it but once at Chin-wang Tao; while Jouy does not appear to have secured any specimens at all in Corea. Ingram records it in the Khingans; while I found it common in North Kirin. Clark records it as being "the most abundant bird about Petraulski, and also the best songster." He also points out that the birds that breed thus far north are larger than those breeding in Yeso or Northern Japan.

* *Phoenicura fuliginosa*. Vigors, Proc. Comm. Zool. Soc. Lond. I, p. 35, 1831.

This bird is a beautiful songster, and is a favourite with the Chinese, who call it *Hung-tien-er*, or red spot. Hartert gives this form in his "Palæarctic Fauna" as *Luscinia calliope*, (Pall).

228. Swinhoe's Robin.

Erithacus sibilans, (Swinhoe).

Larvivora sibilans, Swinhoe, Proc. Zool. Soc. Lond. 1863, June, 23, p. 292.

Records of this little bird occurring in or near the Manchurian Region are not numerous. Jouy secured a single specimen at Seoul in October; and La Touche in a letter to me, written at Chin-wang Tao on May 23rd 1916, said he had recently added this species to his list of local birds. Taczanowski also records it from Corea. From these, however, it may be concluded that this bird occurs in the Manchurian Region, most probably breeding there.

It is brown above, light below, with a chestnut-red tail, and squamated, or scaled breast.

229. Siberian Blue Robin.

Larvivora cyanea, (Pallas).

Motacilla cyanea, Pallas, Zoogr. Ross-As. I., p. 492, 1811-31,

La Touche records this bird as passing through Chin-wang Tao in May, when it is fairly common. I have secured specimens in both the Tientsin district, and the Manchurian forest, near I-mien-p'o, those from the latter place being in the immature plumage, and taken on September 2nd. Being a shy bird, that keeps out of sight, it is not easily obtained, or even seen, which possibly accounts for their being so few records of it in these regions. Ingram, however, records it from the Khingan Mountains, during the breeding season.

The male has the head, and upper parts, including the wings and tail, black, richly suffused with deep blue, the throat, chest, breast and lower parts are of a pure white; a pure black band passes from the forehead below the eye to the shoulder; the bill is black, the legs and feet brownish. The female and immature males have the upper parts olive-brown, the lower parts lighter, with a suggestion of blue on the tail.

230. Red-spotted Blue-throat.

Cyanosylvia suecica robusta, (Buturlin).

Cyanocula suecica robusta, Buturlin, Psoveia i Rusheinaia Okhota, 1907, and Orn. Monatsber, May 1907, p. 79.

This is one of the prettiest of this class of bird common to these parts, and, like the ruby-throat, is a favourite with Chinese bird fanciers. With the head, cheeks, neck, back, and wings of a dull grey-brown, it has the chin, throat, and part of the breast of a bright light mauve-blue, lined with a black band, and then a narrow buff one, followed on the chest and upper breast by rich chestnut-red, a rather large patch of the same colour occupying the centre of the blue; below the chestnut on the breast the plumage is a dirty buff-white; there are distinct eyebrows of the same colour; the tail has the two middle feathers brown, the others rufous or chestnut, tipped with brown; the upper tail-covert is also rufous; the bill and legs are dark brown. Buturlin's subspecies is a larger bird than Swinhoe's *suecica*.

It passes through North China in large numbers during the migratory seasons. I have collected series in the Tientsin district in May and September. It occurs plentifully in Manchuria, where I saw it on the Yalu, and later on the Sungar, though I did not secure specimens. It is known to breed in Siberia.

Family Muscicapidæ.

The flycatchers are represented in our list by some eight species. They differ from the *Turdidæ* and *Sylviidæ* in having stouter, wider bills, usually rather hooked at the tips, with well developed maxillary hairs or spines. Many of them are brightly or conspicuously coloured and marked, though there are some very dull plumaged birds amongst them.

231. Ince's Paradise Flycatcher.

Terpsiphone incei, (Gould).

Muscipeta incei, Gould, Birds of Asia, II, pl. 19, 1852.

Foremost amongst the flycatchers in the matter of striking plumage are the paradise flycatchers, of which one species comes as for north as the Manchurian Region. These birds are remarkable for their very long tails, and the fact that they go through colour

phases in their plumage. The form that occurs in North China and Manchuria is known as Ince's paradise flycatcher, (*Terpsiphone incei*).

In the younger adult males the head, including the cheeks, throat and gorget are of a glossy blue-black; while all the rest of the upper parts, including the wings and tail, are of a rich rusty chestnut-maroon, with a distinct purple gloss on the feathers of the mantle; the chest and upper breast are of an ash-grey; the abdomen and under tail-covert white. The tail is long, the two central feathers attaining a length of about one foot. The bill is very large and sharply hooked at the tip, the legs and feet small, both being black.

As the bird gets older the plumage undergoes a remarkable change in its colour. The whole of the chestnut-maroon and grey gives place to white, the central shafts of the feathers remaining black. The bird now looks extraordinarily beautiful.

The female does not have the central tail feathers more than an inch or two longer than the others; while the upper parts, except the head, are distinctly lighter than in the male, and lack the purple sheen.

This bird has been recorded by La Touche at Chin-wang Tao, and I have taken specimens at Tientsin, where it is fairly common towards the end of May, and early in June. I came across it in mid-summer in the Tung Ling area of North-eastern Chihli, where apparently it was breeding, but the birds were too shy to allow of my approaching near enough to secure specimens. They kept to the heaviest parts of the woods and forests, and it was only when I got up on to the hills and cliffs and looked down upon the former that I saw the birds darting out of the thick cover to seize passing insects.

Captain Karpow secured this bird at Ying-tzu, in South Manchuria. It probably breeds in the forests of Kirin and Heiluag-kiang.

232. Broad-billed Flycatcher.

Alseonax latirostris, (Raffles).

Muscicapa latirostris, Raffles, Trans. Lin. Soc., XIII, pt. 2, p. 312, 1821.

Very different from the foregoing species is the broad-billed flycatcher (*Alseonax latirostris*), which is a bird of dull plumage. The head, nape, back, wings, and tail are a dull dusky-brown, the

fearthers of the secondary coverts, and the secondary flight feathers being edged with buff; the throat is a dull dirty white; the chest and flanks light dusky grey; the middle of the breast and lower parts a dirty white; the bill is black, and broader than in other flycatchers of about the same size; the legs and feet are black. The bird is about 5 inches in length.

Ingram records it from the Khingan Mountains during the breeding season; while La Touche gives it as a migrant at Chin-wang Tao. I secured specimens in the Tientsin district.

233. Chinese Grey-spotted Flycatcher.

Hemichelidon griseisticta, Swinhoe.

Hemichelidon griseisticta, Swinhoe, Ibis, 1861, p. 330.

Recorded by La Touche from North-west Fukien(South-east China) I can find no reference to this bird occurring in the Manourian Region though included in the list of Manchurian birds supplied to me by Mr. Riley and Dr. Richmond. Since, however, Swinhoe records it at Peking, it is probable that it occurs also in Manchuria.

It has the upper parts dark dusky-grey, the lower parts being white, spotted with grey on the breast. It is about the same size as the foregoing.

234. Siberian Spotted Flycatcher.

Hemichelidon sibirica sibirica, (Gmelin).

Muscicapa sibirica, Gmelin, Syst. Nat., I, p. 936, 1788.

With its plumage the colour of that of the broad-billed flycatcher, and much about the same size, the Siberian spotted flycatcher may be recognized at once by its spotted breast and narrower bill. It differs from *griseisticta* in being less grey.

I collected specimens of this bird in Tientsin on May 25th, while La Touche reports it at Chin-wang Tao from the middle of May to June 10th. Ingram, also, records it from the Khingan Mountains in the breeding season.

235. Eastern Red-throated Flycatcher.

Siphia parva albicilla, (Pallas).

Muscicapa albicilla, Pallas, Zoogr. Ross.-As., I, p. 462, 1811-31.

This little bird, which frequents mountain valleys where there are clear, permanent streams, is sometimes called the water-robin.

It has the upper parts a dark olive-brown; the breast slate-grey; lower breast and abdomen dirty white; a patch of orange-red, or rufous occupies the throat, with a black patch below it on the chest; the forehead and eyebrows are white; the tail has the central feathers black, the outer ones being white with broad black tips; the tail-coverts are white. As this little bird flirts its tail a good deal the white is very conspicuous, and helps the observer to recognize it at a considerable distance. The bill and legs are blackish; the length is from 4½ to 5 inches. The female is lighter, and has no red or black on the throat and chest.

I have secured specimens of this bird in Tientsin; while La Touche records it fairly frequently as a migrant at Chin-wang Tao. Ingram reports it from the Khingan Mountains.

236. Tricolor Flycatcher.

Xanthopygia xanthopygia, (Hay.)

Muscicapa xanthopygia, Hay, Madr. Journ., p. 162, 1844.

Known also as the Narcissus flycatcher, and generally called *Xanthopygia tricolor* by authors, this charming little bird is one of the commonest of its kind to be met with in the Manchurian Region, where it occupies the wooded and forested areas for breeding purposes. I met it in numbers on the Yalu, and also in the forests on the Kirin-Fengtien border, east of Kai-yuan; while Ingram records it as *Musicapa narcissina xanthopygia* as breeding in the Khingan Mountains. La Touche also records it at Chin-wang Tao during the latter half of May, and I secured it in the Tientsin district.

It may at once be recognized by its bright colours. The head, mantle, wings, and tail are black; the throat is a rich yellow, passing into orange on the chest and yellow again on the breast, ending in white on the under tail covert; the lower back also is bright

yellow; there are conspicuous white patches on either wing-covert, the white continuing along the outer edge of one of the secondaries; are also conspicuous white eyebrows; bill and legs are blackish; the length is a little over 5 inches.

While in the Tung Ling (Hsin-lung Shan) area I secured two immature female specimens of *Xanthopygia narcissina narcissina*, Tem. on August 8th, and it is possible that this form also occurs in Manchuria, though there are no records.

237. Robin Flycatcher.

Poliomyias mugimaki, (Temminck).

Muscicapa mugimaki, Temminck, Pl. Col. p. 577, fig. 2, 1837.

This bird has the upper parts black, with white eyebrows; part of the upper wing-coverts, and the bases of the tail feathers also white; the lower parts whitish; the chin, throat, chest and breast a rusty rufous colour.

I have a specimen taken in the Tientsin district, and La Touche records it as a scarce migrant at Chin-wang Tao, so that it almost certainly also occurs in Manchuria. It is the *Poliomyias luteola*, Pall. of authors.

238. Blue and White Flycatcher.

Cyanoptila cyanomelæna, (Temminck).

Muscicapa cyanomelæna, Temminck, Pl. Col. p. 470 1838, and T. and S., Faun. Jap. Aves., p. 47, pl. 70, 1850.

This beautiful bird is another of the brilliantly plumaged flycatchers. I came across it for the first time in my experience on the Yalu River, where it seemed to be rather plentiful. Its sweet song first attracted my attention. It sits, when singing in some low bush well hidden by the foliage, and so, though it can be heard plainly, is not at all easy to discover.

It has the crown and back of the head of a beautiful cerulean blue, rivalling that of the king fishers back, but without the hint of green; the rest of the upper parts, including the wings and tail are black heavily washed with shiny light blue, in fully adult males the blue alone showing; the throat, cheeks, and chest are black; the breast and lower parts pure white; the bill and legs are black. The female is dull olive-brown above, lighter below. The bird is a good deal larger than the foregoing, being over 6 inches in length.

La Touche records it under the name of *Cyanecula cœrulecula*, Pall., as occurring fairly frequently at Chin-wang Tao all through the month of May. I also secured it in Tientsin during the migration and in the Tung Ling in August.

Its song is prolonged, vigorous and sweet, having a variety of notes and trills. In spring it indulges in vocal exercises to a considerable extent.

Family Dicruridæ.

This family, to which belong the king-crows, or drongos, is represented in these regions by two forms, both of which occur at least in South and South-western Manchuria. There are the Chinese black drongo (*Buchanga atra cathœca*, Sw.), and the hair-crested drongo (*Chibia hottentotta brevirostris*, Cabanis). The former breeds throughout North China and South-western Manchuria at least. The latter is a much rarer bird, and its breeding haunts in these regions have not yet been ascertained.

239. Chinese Black Drongo.

Buchanga atra cathœca, (Swinhoe).

Dicrourus cathœca, Swinhoe, Proc. Zool. Soc. Lond, 1871, p. 377.

The black drongo is a very common summer visitor on the plains of North China, and South and South-western Manchuria, where it frequents willow trees and elms in the vicinity of streams and rivers. It nests in these trees, and may frequently be seen darting out from he thick foliage to seize some passing insect, very much after the manner of the flycatchers.

It is of a pure black colour, bill and legs included; and has a long, widely forked tail, the latter being forked only towards the end. This gives the bird a very graceful appearance, both in flight and repose. The bird is about the size of a starling, rather more slender in build; while the tail, of course, makes it much longer.

240. Hair-crested Drongo.

Chibia hottentotta brevirostris, (Cabanis).

Trichometopus brevirostris, Cabanis, Mus. Heine. I, p. 112, 1850-51.

The hair-crested drongo is a larger bird than the foregoing, and, though of a pure black colour, differs in that the feathers are shiny, instead of rather dull, while the outer tail feathers curl up

laterally in a very graceful manner. It is further characterized by several long hairs, which grow from the crown and pass backward over the head and nape. Its tail is long, and its bill and feet powerful and of a black colour.

I secured this bird in the Tientsin district on May 23rd, but it must be of rather rare occurrence. It probably occurs also in South and Western Manchuria.

Family Motacillidæ.

We now come to the last family of perching birds, whose members breed in the Manchurian Region, but do not winter there. The family *Motacillidæ* includes the pipits and wagtails, birds that are so familiar to all as to need no general description. Our list contains some seventeen species and subspecies, of which five are pipits, eleven are water-wagtails, and one is the peculiar forest wagtail.

241. Striped Pipit.

Anthus richardi, Vieillot.

Anthus richardi, Vieillot, Nouv. Dict. d'Hist. Nat. XXVI, p. 491, 1818.

This large pipit is one of the commonest of the five forms that occur in these regions. It breeds commonly throughout Siberia; while Ingram records it from the Khingans during the breeding season. La Touche records it as passing through Chin-wang Tao in May in small numbers. It is plentiful round Tientsin in the spring and autumn; and I saw it in comparatively large numbers in the grasslands of Inner Mongolia; where I secured a specimen. This was identified at the Smithsonian Institution as *richardi*, but my specimens secured in the Tientsin district have been identified as Blyth's subspecies *striolatus*. However, all Mr. La Touche's and my birds which were taken in these areas when compared agreed with each other, and with Oates' description of *A. richardi*, and not with *striolatus*.

Our bird is of a dark brown above, but slightly streaked; while the lower parts are buff, slightly spotted on the chest; the tail has the outside feathers mostly white—in which it differs from *striolatus*, which has only the last inch white—the next two tipped with white, the rest dark brown, almost black. This bird has an unusually long metatarsus, and hind claw, which is like that of the larks.

It nests in hollows on the ground in the open more or less swampy meadows of the northern forest lands. Four to six eggs are laid.

242. Eastern Tree-Pipit.

Anthus trivialis hodgsoni, Richmond.

Anthus hodgsoni, Richmond, in Blackwelder, Research in China, I, pt. 2, 1907, p. 493.

This pipit, which is the *Anthus maculatus* of authors, differs from the European form in being even more spotted. The crown, nape, and back are olive-brown, more or less streaked or spotted with a darker colour; the throat, and breast are a pale buff-brown, spotted with black; the lower breast, and belly are a dirty white, streaked with black-brown on the flanks; the wings are a dusky-brown, the feathers being edged with light grey-brown; while the tail is brown, the outer feathers being edged and broadly tipped with white; there is a distinct whitish eyebrow. The bird is about 6 inches in length.

It breeds in the open, building a nest of grass, lined with moss and hair, on the ground. Four to six eggs are laid.

Ingram records this bird under the name *Anthus trivialis maculatus*, as occurring in the Khingan Mountains during the breeding season; while Clark records it, also as *maculatus*, as common in Peropaulski, Kamschatka, presumably in summer, for he gives no date. It occurs throughout China, appearing on the northern coasts of the Pechili Gulf, and Corean Bay about the end of April or beginning of May.

I secured specimens in the Tientsin district in May.

243. Petchora Pipit.

Anthus gustavi, Swinhoe.

Anthus gustavi, Swinhoe, Proc. Zool. Soc. Lond., 1863, pp. 90 and 273.

The Petchora pipit is somewhat smaller than the foregoing, and may further be distinguished by its much more speckled appearance, and browner, less olive upper parts.

The crown, and nape are brown, streaked with black; the back, wing-coverts and upper tail-covert dusky brown, broadly streaked with black; the wings much as in the tree-pipit; the tail has no

white; the throat is white tinged with very light buff; the chest is light buff, spotted with dark brown; the lower parts dirty buff-white, streaked with dusky on the flanks.

This bird also was found to be common "in the lowlands about Petropaulski." La Touche records it from Chin-wang Tao, though not in great numbers. It is fairly common round Tientsin in spring and autumn.

244. Red-throated Pipit.

Anthus cervinus, (Pallas).

Motacilla cervina, Pallas, Zoogr. Ross.-As., I, p. 511, 1811-31.

La Touche records this bird twice at Chin-wang Tao; while I secured it at Tientsin, so that it may safely be concluded that it occurs in Manchuria as a summer visitor.

This pipit has the throat and face a vinous-red in the breeding plumage of the males; the upper parts greyish-brown, and closely spotted with black; the chest and flanks streaked with dark brown; the outer web of the outer tail feathers white; also white on the tips of the secondary coverts.

245. Japanese Water-Pipit.

Anthus spinoletta japonicus, T. & S.

Anthus japonicus, T. & S., Fauna Japonica, Aves, pl. 24, 1850.

The Japanese water-pipit is, perhaps, the commonest of the East China and Manchurian pipits. It may be distinguished by its plainer plumage, which is of a dusky brown above, light buffy white beneath.

Mr. La Touche records it as passing through Chin-wang Tao in great numbers from the middle of April to the first week in May. Clark records it as "common in the grassy lowlands near Milne Bay, Simushir," on June 23rd, from which we may take it that it was breeding there.

246. Blue-headed Wagtail.

Budytes flavus simillimus, (Hartert).

Motacilla flava simillima, Hartert, Vögel pal. Fauna, I, 1905, p. 289.

This bird has the head a dark slaty-blue or grey; the upper parts dark olive-green; the lower parts bright yellow. It has white eyebrows, and light ear-coverts, in which it differs from the next two species, *Budytes flavus borealis* having no eyebrows or light ear-coverts, and *B. f. taivanus* having yellow eyebrows.

I secured specimens of *simillimus* on the Lower Sungari River, near its junction with the Amur, in which area this species was breeding extensively.

La Touche recorded *simillimus* and *borealis* together at Chinwang Tao, and states in his notes that they were not recorded separately, presumably because they were so difficult to distinguish between at a distance. I also secured a specimen of this bird in the Tientsin district. Clark records it from Petropaulski, where five males were secured.

247. Eastern Grey-headed Wagtail.

Budytes flavus borealis, (Sundevall).

Motacilla flava borealis, Sundevall, Kongl. Vet. Acad. Handl. for 1840, 1842, p. 53.

This form differs from the foregoing in having a greyer head, and no eyebrows or light ear-coverts. Otherwise the two birds are indistinguishable.

I secured specimens in the Tientsin district; while Ingram records it from the Khingan Mountains in the breeding season.

248. Yellow-browed Wagtail.

Budytes flavus taivanus, Swinhoe.

Budytes taivanus, Swinhoe, Ibis, 1866, p. 138.

This wagtail differs from the two foregoing in having the head olive-green or grey-green instead of grey or blue-grey, and from *simillimus* in having yellow eyebrows. The rest of the plumage is as in *simillimus* and *borealis*.

This form has been obtained in Peking, and was also taken by La Touche's collectors on migration at Sha-wei-shan, at the mouth of the Yang-tzu. It probably breeds in the Manchurian Region.

249. Yellow-headed Wagtail.

Budytes citreolus citreolus, (Pallas).

Motacilla citreola, Pallas, Reis. Russ. Reich., III, p. 696, sp. 14, 1776.

The most beautiful of the wagtails is the yellow-headed wagtail, which is fairly common in spring and autumn in these parts.

The head, nape, throat, breast, and belly are of a brilliant sulphur yellow; the back, wing-coverts, and rump are of a dark grey; there is a large white patch on the wing; while the flight feathers are black edged with white; the tail is black, the four outer feathers white; bill and legs are black. The female has the head greyish, and the yellow under parts duller.

I secured an immature specimen on the Sungari River on August 7th, 1915, while Ingram records the species from the Khingan Mountains in the breeding season.

250. Eastern Grey Wagtail.

Motacilla boarula melanope, Pallas.

Motacilla melanope, Pallas, Reis. Russ. Reich. III, p. 696, No. 16, 1776.

This handsome wagtail occurs all over North China and Manchuria. I have secured specimens from South-western Shensi in the west, and the Yalu River in the east. It inhabits the stony banks of rivers, and mountain streams, where it builds its nest in hollows in mossy banks. It appears to avoid marshes, swamps, and open flatlands, except during the migrations.

I had the opportunity of watching this bird on the Yalu, where it was abundant. Both parent birds assist in feeding the young, as well as in the business of incubation.

The male has the head, nape, back, and wing-coverts slaty-grey; the wings black, edged with white; the upper tail-covert yellowish grey; the middle tail feathers black, the outer six white,

edged with black; a light streak over the eye, and also a mustache streak; the throat and chest black, the rest of the lower parts a rich light egg-yellow, getting deeper under the tail. The female has the throat white, as also has the male in winter.

Ingram records this species from the Khingan Mountains in the breeding season.

251. White-faced Wagtail.

Motacilla alba leucopsis, Gould.

Motacilla leucopsis, Gould, Proc. Zool. Soc. Lond., 1837, p. 78.

This bird may be distinguished by its white face, cheeks, and lower parts; black throat, chest, back, and wing-coverts; black and white wings, and tail.

It occupies, and breeds in, mountain valleys; and is not often seen on the plains, and low-lying marshes, except in the migrations. I have seen it in mountains of Shansi, Shensi, and Kansu. It builds a nest in banks, or on ledges at the base of cliffs.

I secured specimens on the Yalu River, as well as in Tientsin. It is recorded by Poliakow from the Ussuri River.

252. Streak-eyed Wagtail.

Motacilla alba ocularis, Swinhoe.

Motacilla ocularis, Swinhoe, Proc. Zool. Soc. Lond., 1863, p. 17.

The streak-eyed wagtail resembles the foregoing, except that the back is a fine slate-grey instead of black; while there is a black streak through the eye dividing the white of the face from that of the cheeks.

This bird is extremely common in these parts. Ingram records it from the Khingans in the breeding season, and La Touche as a migrant at Chin-wang Tao. I secured a series of specimens in the Tientsin district. It is a very common species in these parts.

253. Kamschatkan Wagtail.

Motacilla alba lugens, Kittlitz.

Motacilla lugens, Kittlitz, Kupfertafeln zur Naturgeschichte de Vögel, p. 16, 1832.

This bird probably passes through Manchuria on its way to its breeding grounds in the Kuril Islands, and Kamschatka, where Clark records it as common, "frequenting the sea-shore, especially about rocky beaches." It is recorded by Buturlin from the Ussuri region.

It is larger than the other forms of *alba*, has the black streak through the eye, the back black, and the primaries and tail feathers white.

254. Siberian White Wagtail.

Motacilla alba baicalensis, Swinhoe.

Motacilla baicalensis, Swinhoe, Proc. Zool. Soc. Lond. 1871, p. 363.

This subspecies of *alba* is also a very common form in North China and Manchuria. It may be recognized at once by the white of its face continuing below the bill to include the throat, there being no black streak through the eye; there is also a greater amount of white on the wings.

I secured specimens in the Tientsin district.

255. Forest Wagtail.

Dendronanthus indicus, (Gmelin).

Motacilla indica, Gmelin, Edition Lin. Syst. Nat. I, p. 962, 1783.

The forest wagtail is one of the rarer members of the family. I came across it breeding on the Yalu River, where I secured specimens. It builds its nests along river banks on ledges at the bases of cliffs, or overhanging rocks. La Touche records it at Chinwang Tao only twice in three years, once a single bird, and once five. Taczanowski records it from Corea. I have also secured it in the Tientsin district during the migrations.

The male has the upper parts an olivaceous dusky-grey; a white streak passes backwards from back of the eye to the back of the head; the throat, sides of neck, chest, and lower parts are white, with a black band across the chest, and the commencement of another on the sides of the breast; the wings are dark greyish-black, barred with white, and having white patches on the primaries; the tail is black, the two outer feathers being white, the next pair half white.

The habits of this bird are very much those of the wagtails, but it keeps rather to waters passing through wooded areas. It differs from the wagtails in that it builds its nest in trees, often at a considerable height from the ground.

CHAPTER VI.

Migrant Birds that Breed in the Manchurian Region.

Picidæ to Upupidæ.

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Migrant Birds that Breed in the Manchurian Region.

Picidæ to *Upupidæ*. (Picarians to Hoopoes.)

The birds to be dealt with in this chapter, though in some ways similar to those in the last, do not belong to the great group known as the passerines or perching birds. They all differ considerably in structure, and belong to different orders. It is chiefly in the structure of their feet that they differ from the passerines. There are some seven families to be dealt with, none of which are represented in our region by many species. These are the *Picidæ* (woodpeckers and wrynecks), *Cuculidæ* (cuckoos), *Micropodidæ* (swifts), *Caprimulgidæ* (nightjars), *Coracidæ* (rollers), *Alcedinidæ* (kingfishers), and *Upupidæ* (hoopoes). As these do not, properly speaking, form a group of birds it is better to deal individually with them; though it may be said that they are all purely migratory, only visiting these nothern areas to breed.

Family Picidæ.

Though most of the woodpeckers are migratory to a certain extent, their migrations, as a rule, are comparatively local, the birds moving north and south over limited areas within the boundaries of the countries they occupy, so that they may be met with in those countries in both winter and summer. On this account they were placed with the permanent residents. There is however, one form of woodpecker that is purely migratory, leaving the Manchurian Region entirely for the winter, and returning thither in the spring to breed. This is the chestnut-breasted wood pecker (*Hypopicus hyperythrus subrufinus*, Cab. and Hein.) To this species must be added the Japanese wryneck (*Jynx torquilla japonica*, Bon.), another member of the *Picidæ*, that occupies the Manchurian Region under the same circumstances.

256. Chestnut-breasted Woodpecker.

Hypopicus hyperythrus subrufinus, (Cabanis and Heine.)

Xylurgus subrufinus, Cabanis and Heine, Mus. Heineanums, IV, pt. 2, p. 50, 1863.

A good specimen of this woodpecker, which I secured in the Tientsin district, was identified at the Smithsonian Institution as above . Ingram records it under the name *Hypopicus poliopsis,* Sw. from the North-western Kirin plain in August and September, but states that the birds secured there may be subspecifically different from the Chinese *H. poliopsis,* in which case he suggests the name *mantchuricus.* La Touche records it at Chin-wang Tao in May, under the name *poliopsis.*

It may be recognized by its chestnut-brown breast and adomen, which colour continues round the sides of the neck, almost meeting on the nape; the back and wings are black, closely spotted with white; the chin, cheeks, and thighs are grey, spotted with small black dots; in the tail the four central feathers are black, the others black, barred with white. The male has a fine crimson crown and nape, which colour is absent in the females, these parts being black, spotted with white. In both sexes the lower abdomen and under tail-covert are crimson. The bill and legs are grey. Length about 8 inches

This bird appears in these regions in May, and breeds upon the plains of North China and Western Manchuria; returning southward in September.

257. Japanese Wryneck.

Jynx torquilla japonica (Bonaparte.)

Yunx japonica, Bonaparte, Consp. Avium. I, p. 112, 1850.

So well known a bird as the wryneck, sometimes called in rural England, the "cuckoo's mate," because of its appearance in spring almost simultaneously with the cuckoo, needs little description here. With its thin bill, zygodactyle (two toes forward and two backward) feet, its brown plumage, closely vermiculated and mottled with black and brown, and slight crest, which it usually carries erect, it is unmistakable. In size it about equals the small woodpeckers, *Yungipicus.* Our subspecies very closely resembles

true *torquilla*, but has the upper parts browner, the lower parts more ochre coloured. It is also smaller. La Touche records *J. torquilla* fairly often at Chin-wang Tao during the migrations that he observed.

It undoubtedly occurs in the Manchurian Region to breed.

Family Cuculidæ.

The cuckoo family is represented in the general region under discussion by a number of forms, but owing to the use by various authors of a number of names, often different names being used for the same bird, the subject is rather complicated. Nevertheless, there are at least four distinct species that are known to occur in the Manchurian Region, while a fifth form, *Cuculus kelungensis*, Swinhoe, is known to occur in South Corea, and may, or may not range as far north as South Manchuria.

258. Eastern Common Cuckoo.

Cuculus canorus telephonus, Heine.

Cuculus telephonus, Heine, Journ. f. Orn., 1863. p. 352.

A large cuckoo I obtained on the Yalu River in May has been referred to Heine's *Cuculus canorus telephonus*. Clark records the same species from the Petropaulski district, where he says it was abundant in the scrubby growth about the town. The same authority identifies a specimen in Jouy's collection from Fusan, Corea, taken on May 23rd 1886, with this species; while Taczanowski records if from Seoul. La Touche and Ingram record *C. canorus* from Chin-wang Tao and the Khingans, respectively.

In this bird the head and upper parts are an ashy-grey, slightly darker on the wing-coverts, and more bluish on the rump and upper tail-covert; the flight feathers are a dark brownish-black, barred on the inner web with white, which, however, does not show when the wings are folded; the tail is greyish black, spotted with white down the mid-rib of each feather, the spots getting larger on the lateral feathers, and the tip of each feather also being white; the throat and chest are of a lighter grey; the breast and lower parts are white barred with black. The bird is 14 inches in length. It differs from true *canorus*, the common cuckoo of Europe, in being more thinly barred on the under parts.

259. Himalayan Cuckoo.

Cuculus intermedius intermedius, Vahl.

Cuculus intermedius, Vahl, Scrift. Nat. Selsk. IV, p. 1, p. 59, 1797.

Ingram records this bird from the Khingan Mountains; while a specimen which I secured in the forest on the Fengtien-Kirin border, east of Kai-yuan, and which I gave to Mr. La Touche was identified by him as *intermedius*. On the other hand a specimen obtained by me in the I-mien-p'o district, and sent to the Smithsonian Institution has been identified as Gould's *C. optatus* (*Proc. Zool. Soc. Lond, 1854, p. 18*). Hodgson's name, *C. saturatus*, (*Journ. As. Soc. Beng., 1843, p. 942*) is also used by some authorities to denote this bird.

As it seems probable that the names *optatus* and *intermedius* are synonymous, the latter takes precedence.

Our bird may be recognized by its smaller size, and darker upper parts than *C. canorus telephonus*. It has the head and upper parts a dark slate-grey, the under parts a dirty buffy-white, broadly barred on the breast and abdomen with dusky. It is 12 inches in length, and has a shorter wing than *telephonus*.

The species is common in the Manchurian forests, the most peculiar thing about it being one of its calls, which may be rendered; *whoom whoom whoom*, and is very resonant, or vibrant. It also has a call somewhat like that of the common cuckoo, but differing in that it is always given twice in rapid succession, the second in a lower scale.

260. Amur Hawk-Cuckoo.

Hierococcyx fugax nisicolor, (Blythe).

Cuculus nisicolor Blyth, Journ, As. Soc. Beng. XII, p. 943, 1843.

Cuculus hyperythrus, Gould, Proc. Zool Soc. Lond., 1856, p. 96.

Schrenck in his work on the birds of the Amur figures a hawk-cuckoo occurring in these parts to which he applies the name *Cuculus sparverioides* Vig.; but it appears that he mistook a young specimen of Blythe's *Hierococcyx fugax nisicolor* for Vigors' *sparverioides*.

Thus it may be taken that the former bird occurs in the Manchurian Region to breed.

It is of a general dark brownish-grey above, the wings and tail being barred with darker bands, and the ends of the tail feathers being more reddy-brown, tipped with white; the lower parts in the adult are vinous-buff, in the immature white, streaked with black or dusky, the white extending irregularly round the neck; there is also white on the secondaries.

261. Greater Hawk-Cuckoo.

Hierococcyx sparverioides, (Vigors.)

Cuculus sparverioides, Vigors, Comm. Zool. Soc. Lond. Pt. I, 1832, p. 173.

This bird, which is much larger than the foregoing, may be further distinguished by its barred breast in both adult and immature specimens. The upper parts are of a dull lead-brown; the tail is broadly barred with a deeper colour; the throat and chest tinged with chestnut.

Most writers give this bird as inhabiting the Amur region, on account, presumably, of Shrenck's record as mentioned above. The species has been recorded by La Touche at Chinkiang on the Yang-tzu. Taczanowski records it from the Coastal regions on the border of the Japan Sea.

Family Micropodidæ.

There are three forms of swift occurring in the Manchurian Region. These birds, as a family, may be recognized by their long, slender wings, wide gape, short bills, and small, weak feet; the latter are smaller and weaker in proportion than in the swallows, with which the swifts were for long classed by naturalists. The swifts, generally speaking, are birds of somber plumage. They obtain their living from the air, where, like the swallows and nightjars, that catch their insect prey in full flight. Judging from their usually fat condition they live well. They are all migratory, as far as such northerly climes as the Manchurian Region are concerned, as may be imagined from their mode of obtaining a livelihood. They nest in holes in cliffs, the eaves of old buildings, and other such suitable places, the female laying but two eggs.

262. Pacific White-rumped Swift.

Micropus pacificus, (Latham).

Hirundo pacifica, Latham, Ind. Orn. Suppl., p. 58, 1790.

The Pacific white-rumped swift, or Siberian swift, as it is sometimes called, is a rather large bird of a blackish colour, having, as its name suggests, a white patch on the rump, by which it may at once be distinguished. According to David this bird breeds in the mountains west of Peking. La Touche records it at Chin-wang Tao during June of 1911 and 1912, and as early as April 14th in 1913. He remarks of a flock seen on June 15th that the birds were "apparently only evening visitors from an adjacent breeding haunt," that breeding haunt doubtless being the rocky hills some ten miles inland. Clark records what he thought were these birds as "very abundant about the rugged shores and summits of the more inaccessible rocky hills on Matsushima." Jouy's collection contains a specimen from Fusan, so that it is safe to presume that the bird occurs and breeds in Manchuria.

As a matter of fact of the two species of swift that are common in these parts, the white-rumped swift and the Chinese swift, the former occupies the wilder regions away from the haunts of man; while the latter seems to confine itself almost entirely to towns for breeding purposes, nesting in the eaves of gate towers, pagodas, temples, and other tall and ancient buildings.

263. Chinese Swift.

Micropus apus pekinensis, (Swinhoe).

Cypselus pekinensis, Swinhoe, Proc. Zool. Soc. Lond., 1870, June 9, p. 435.

This bird differs from the foregoing in being smaller, and of an entirely dusky-black colour excepting for a white face and throat.

As already stated, it nests in old buildings in the towns and villages of North China, and in Manchuria, at least in the south and south-west. I secured specimens in the Tientsin district, and La Touche records it as breeding at Shan-hai Kuan, on the Chihli-Manchurian border.

264. Spine-tailed Swift.

Hirundapus caudatus caudatus, (Latham).

Hirundo caudata, Latham, Ind. Orn. Suppl. p. 57, 1790.

I secured a single specimen of this large and handsome swift in the forest near I-mien-p'o, North Kirin, on August 30th, where for a few days we saw four or five of these every evening at about six o'clock. They doubtless came from some cliffs in the vicinity, unknown to us.

The specimen, which I brought down with a shotgun from a great height, had its mouth and gullet crammed with insects, chiefly Coleopterons.

Measuring about 8 inches in length, and with a wing of the same length, this bird has the head, nape, back, chest, and breast of a dusky-brown, darker on the crown and nape, with a greenish-blue sheen, and becoming lighter, almost white in the middle of the back; the wings and tail are black, with the same greenish-blue sheen, but more intense; the forehead, chin, throat, lower abdomen, and under tail-covert are white, as also are the inner webs of the shortest secondaries; the bill is small; the gape wide; and the legs, though small, are strong. The mid-ribs of the tail feathers extend beyond the web in the form of sharp spines.

I secured a specimen in the Tung Ling forest area of North-eastern Chihli, where I saw a great many flying about over the hills one afternoon. This was on August 26th. There were a lot of high cliffs in the area, where, doubtless, they nested. Exactly how they build their nests one cannot say, but, judging from their spiny tail-feathers, it is possible that in this respect they are like the American chimney swift (*Chætura pelagica*), which sticks twigs by means of its saliva to the brick-surface to form a shallow nest.

Family Caprimulgidæ.

As far as I know only one form of night-jar occurs in the Manchurian Region, this being the common form of Eastern Asia, *Caprimulgus indicus jotaka*, T. & S.

265. Eastern Nightjar.

Caprimulgus indicus jotaka, T. & S.

Caprimulgus jotaka, T. & S., Fauna Japonica, Aves, p. 37, pl. 12, 1850.

A single immature specimen of the nightjar taken by me on the north bank of the Sungari River, near its junction with the Amur, has been referred to this species. I also secured several specimens in the Tientsin district during the migrations.

This eastern form resembles the European species in general appearance, having the same peculiar mottled plumage, but differs in being larger, darker, and in having the white of the outer tail feathers more pronounced.

The nightjar is very common in certain parts, especially where there are cliffs adjacent to a river or stream with plenty of brush and trees. Here, as twilight comes on, its familiar knocking call may be heard, and soon the bird itself will be seen performing its swift evolutions in the chase of insects, upon which it lives. It is never seen in broad daylight unless put up from its layer in the underbrush.

Family Coraciidæ.

The rollers are represented in these regions by the oriental broad-billed roller (*Eurystomus orientalis calonyx*, Sharpe), which breeds in great numbers in the forested areas of the Manchurian Region.

266. Oriental Broad-billed Roller.

Eurystomus orientalis calonyx, Sharpe.

Eurystomus calonyx, Sharpe, Proc. Zool. Soc. Lond., 1890, p. 551.

This is one of the most handsome and beautifully plumaged of all the birds that visit, or are found in, the Manchurian Region; though it has to be seen alive and active to be appreciated to the full. Apart from the head, which is black, the plumage presents a series of blues and blue-greens, that almost beggar description, while as if designed for contrast the bill and legs are of a brilliant orange red. The throat feathers, which are blackish, have their centres a rich purplish-blue; the chest is a deep steel blue-green, getting lighter and more intense on the breast and abdomen; an

even richer steely blue-green marks the upper parts, especially the wing-coverts; the flight feathers and tail are a rich purplish-blue, a broad band of pale electric blue spreading right across the primaries. The bill is broad, powerful, and sharply hooked at the end; the legs short but strong, the feet strong.

I found this bird extremely common in the forested area on the Fengtien-Kirin border, east of Kai-yuan, where I tried hard to get specimens; but failed to secure more than one, on account of the extreme watchfulness and wariness of the bird. They kept to the tops of the highest trees, whence they darted out to catch passing insects, much in the manner of flycatchers. Their evolutions in the air were very graceful, and, with their long wings, reminded one much of the nightjar when flying. They kept up an incessant trilling and rather raucous calling, not unlike the noise made by the nutcracker. I saw one or two specimens in the forested areas round I-mien-p'o, and have also secured specimens in the Tientsin district. James secured specimens in the Chang-pai Shan (South Kirin) on July 20th, 1886. I also saw birds of this species in the Tung Ling forested area of North-eastern Chihli; while Jouy collected specimens on Tsushima Island.

The eggs of this bird are laid in the hollow of a tree at a considerable height from the ground, there being, apparently, no attempt at building a nest.

Family Alcedinidæ.

The kingfishers are represented amongst the summer visitors to the Manchurian Region by three species, of which but one, the eastern common kingfisher (*Alcedo ispida bengalensis*, Gm.) is at all plentiful. Of the other two, one, the ruddy kingfisher (*Halcyon coromandus major*, T. & S.) has been recorded, under the name *coromandus*, once from Manchuria and once from Corea, while the other has not been recorded actually from Manchuria, though its occurrence in North-eastern Chihli makes it practically certain that it occurs at least in South-western Fengtien, if not elsewhere. This last is the black-capped kingfisher (*Halcyon pileatus*, Boddaert), which is very common in North China in summer.

267. Eastern Common Kingfisher.

Alcedo ispida bengalensis, Gmelin.

Alcedo bengalensis, Gmelin, Syst. Nat., I, p. 450, 1788.

Ispida bengalensis, Brisson, Orn., IV, p, 475, 1760.

The common kingfisher of these parts resembles the British bird *Alcedo ispida*, of which it is a subspecies, and from which it differs only in size, and wing measurement. The oriental form, *bengalensis*, measures from 6 to 6½ inches, as against 7 inches in true *ispida*, the wing also being about ¼ inch shorter. A specimen from the Yalu River has the wing 2.82 inches, one from Foochow, in Fukien, S. E. China, has it 2.8 inches, and one from South-western Shensi has it only 2.65 inches. There is no difference in the plumages of these three birds, nor do they differ in this respect from *ispida*.

So well known a bird as the common kingfisher needs no description here.

Our subspecies occurs all over the Manchurian Region, wherever there are water, marshes, rivers, and even pools and streams in the forest furnishing it the means of livelihood. I found it nesting on the Yalu, and also on the Upper Sungari, the nests being placed, as with *ispida*, at the end of long tunnels in river banks, usually well out of reach of the water.

268. Black-capped Kingfisher.

Halcyon pileatus, (Boddaert).

Alcedo pileatus, Boddaert, Tabl. Pl. Enl. de Daub., p. 41, 1783.

This bird, as already stated, is common enough in North China, and, though not so far recorded, almost certainly occurs at least in South-western Manchuria.

The head, back, wings, and tail are black, heavily washed with purple and blue on the back and wings; the throat is white, the chest, breast and abdomen chestnut, sometimes lightly barred with black; the bill and legs are orange-red. The bird is very much larger than the common kingfisher, measuring about 12 inches in length.

I frequently saw this bird while travelling in Shansi, Shensi, and Kansu; and once had the opportunity of watching one kept in captivity. This specimen, when fed with small live fish, used to stun its prey by banging it against its perch before swallowing it head first. It became very tame after a few weeks' captivity. It nests in holes in banks along rivers and streams, feeding upon crustaceans and even insects as well as fish.

269. Ruddy Kingfisher.

Halcyon coromandus major, (T. & S.)

Alcedo (Halcyon) coromanda major, T. & S., Fauna Japonica, Aves, pl. 39, 1850.

A specimen of this species was collected by James in Central Manchuria on June 20th, 1886, which, as Ingram remarks, doubtless marks the northern limit of this bird's range. Ingram used the name *coromandus*. Taczanowski also reports this bird, under the same name from the environs of Seoul, Corea.

The upper parts are russet with a fine violet sheen, and a patch of light blue on the lower back; the under parts are reddy-chestnut, the throat and abdomen being paler than the rest; the bill and feet are crimson-red. As the name suggests this bird is larger than true *coromandus*, being a more easterly form of the Indian species. It also has the bill less deep at the base, and the wing longer.

Family Upupidæ.

The hoopoes, of which but one form occurs in the Manchurian Region, may easily be recognized by their long, slender, curved bills, large crests, and pied wings and tails. They inhabit both wooded and open country, though never occurring in dense forest. They nest in holes in cliffs, trees or the walls of old buildings, living entirely upon insects and grubs, for which they may frequently be seen probing loose soil and the matted roots of grass and stubble. They have a peculiar call, which may be rendered *hoo poo poo, hoo poo poo, hoo poo poo*. It may be heard at a considerable distance, as in the cuckoo, and is repeated at frequent intervals throughout the spring, less frequently as the summer progresses. It is to this peculiar call that the birds owe their name, both classic and popular, and in China the bird is called *P'u-p'u-tzu*. The hoopoes also make a loud hissing noise when startled.

270. Eastern Hoopoe.

Upupa epops saturata, Lönnberg.

Upupa epops saturata, Lönnberg, Arkiv. för Zoologi, V, No. 9, p. 29, 1909.

I have sent specimens of this bird to the Smithsonian Institution from South-western Shensi, the Tientsin district, and the Lower Sungari; but this by no means indicates its true distribution nor its abundance in these regions. I saw it on the Yalu in the spring of 1914, and throughout Fengtien and the unforested areas of West Kirin in the spring and summer of 1913. It is extremely common throughout Chihli, Shansi, Shensi and Kansu, and even occurs in Inner Mongolia.

The bird has a fine crest of a rich light chestnut or chestnut buff colour, the feathers being tipped with black; the head, neck, mantle, and upper breast are buffy-chestnut; the back, wings, and tail are black barred white or sandy-white; while the lower breast and abdomen are white, streaked with black or dusky; the under tail-covert is white; the bill is long, slender, curved downward, and of a brown colour; the legs and feet are blackish.

It has the power of erecting its crest, and when it does so looks very handsome. The call, which is *hoo poo poo*, all on the note upper *a*, is uttered at short intervals as the bird sits on a wall or large tree branch (it never sits on thin branches or twigs, as do the passerines), and with each note it nods its head as though pecking. Then it usually erects its crest and makes a hissing, or loud 'breathing' noise, repeated several times ere it takes flight to some other perch, where it goes through the whole performance once more. The flight its undulating, like that of the woodpecker, but not so fast.

The subspecies *saturata* is acknowledged by Hartert on the grounds that it is a little darker than true *epops*. A comparison of specimens from Mongolia, China, Siberia and even North India, with others from Europe show that there is practically no difference. If anything the European form seems to have a slightly darker crest.

CHAPTER VII.

Aquatic Migrant Birds that Breed in the Manchurian Region.

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Aquatic Migrant Birds that Breed in the Manchurian Region.

In the present chapter it is intended to deal with a number of aquatic migrant birds, other than those forms known, generally, as the birds-of-passage, marine birds, and wildfowl, that breed in the Manchurian Region. These include the herons (*Ardeidæ*), the storks (*Ciconiidæ*), the ibises (*Threskiornithidæ* or *Ibidæ*), the spoonbills (*Plataleidæ*), the rails (*Rallidæ*), the grebes (*Colymbidæ*), the divers (*Gaviidæ*), and the cormorants (*Phalacrocoracidæ*), all the species belonging to which, though breeding in Siberia and neighbouring North China as well, are known to breed in the marshes and swamps, or upon the rivers, lakes and streams of our region. They are all migrants in the truest sense, though they seem to travel as little as possible, many individuals keeping just clear of the heavy frosts, travelling no farther south in autumn than is necessary to ensure open water and an adequate food supply in winter; and also, apparently, travelling no further north than is necessary to ensure sufficiently cool and roomy nesting haunts.

There are individuals amongst them, those that breed in Siberia for instance, who travel much farther than others, but even so they do not indulge in anything like the great flights undertaken by the birds-of-passage (plovers, snipe, sandpipers, and the like), or by the wild-fowl (ducks, geese, and swans), which are really birds-of-passage as well, though usually looked upon as distinct.

Family Ardeidæ.

This family includes the bitterns, egrets, and herons, and is represented in the Manchurian Region by some thirteen species. The whole family is characterized by the presence in its members of long, pointed and strong bills, long necks, and long legs, their bodies usually being adorned with some sort of plumes. They are mostly fish-eaters, being expert fish-catchers; and build their nests in trees. They range in size from the great grey heron (*Ardea*) down to the diminative little bittern (*Nannocnus*), and show a considerable variation in the colours and plumages of the various species.

271. Bittern.

Botaurus stellaris, (L.)

Ardea stellaris, L., Syst. Nat., I, p. 239, 1766.

The bittern is a very common inhabitant of the marshes and swamps of the Manchurian Region, as well as of North China, during the warmer months. I have seen it frequently in both areas. It appears in these regions in spring as soon as the ice disappears, and stays on till the first severe frosts send it south again in the late autumn.

Buturlin has described an eastern subspecies of the European form, namely, *Botaurus stellaris orientalis*, but from what I have seen of the bird it is indistinguishable. There is a certain amount of individual varation, some specimens being darker than others. Under the circumstances there is no need to describe so well known a bird.

272. Schrenck's Little Bittern.

Nannocnus eurythmus, (Swinhoe).

Ardetta eurythmus, Swinhoe, Ibis, 1873, p. 73.

Schrenck's little bittern may be recognized by its small size and dark, chocolate brown upper parts. It is fairly common in Manchuria. I saw it on two occasions on the upper Sungari, twice in the West Kirin forests—where, apparently, it was nesting in the rushes that lined the margins of one of the crater lakes—, and once in an open clearing in the forest near I-mien-p'o, North Kirin. Schrenck records it from the Amur region, and La Touche at Chin-wang Tao. It is also plentiful in North China, and I have secured it in considerable numbers in the Tientsin district.

The crown, cheeks, nape, back of neck, back, scapulars, and tail are of a dark chocolate, tending to ashy-black on the crown; the wing-coverts are buffy-grey; the flight feathers are ashy-black; the throat, front and sides of neck, breast, and lower parts are light buff, with a few dark streaks down the middle of the neck from the chin to the chest, and a few broad black streaks on the sides of the chest. In immature specimens the lower parts are much more streaked with black; while the upper parts from the nape to the tail are streaked and spotted with white.

273. Cinnamon Little Bittern.

Nannocnus cinnamomeus, (Gmelin).

Ardetta cinnamomea, Gmelin, Syst. Nat. I, p. 643, 1788.

This bird is very much like *Nannocnus eurythmus;* but differs in having the upper parts, wings, and tail uniform chestnut-red, the tufts of feathers on the shoulders being black and buff, and the throat, fore-neck, and lower parts rich buff.

Schrenck records it from the Amur region.

274. Chinese Little Bittern.

Ixobrychus sinensis, (Gmelin).

Adetta sinensis, Gmelin, Syst. Nat., I, p. 642, 1788.

This bittern is smaller than the foregoing species, from which it is further distinguished by its lighter plumage.

The crown, nape, wings, and tail are black, the sides of the head and neck pale pinky-buff; the back of the neck, especially where it joins the back, a rich vinous colour; the back and scapulars vinous-grey; the wing-coverts buffy; the throat white; front of neck, chest, and lower parts light buff, with black streaks on the sides of the chest. The young has the upper parts yellowish, streaked with black; the lower parts white or buff, streaked with brown.

This species is as common as *Nonnacnus eurythmus*, occurring all over North China and Manchuria. Taczanowski records it from Chemulpo in Corea.

275. Amur Green Bittern.

Butorides amurensis, (Schrenck).

Ardea virescens, var, amurensis, Schrenck, Reise und Forsch. im Amurlande, I, pt. 2. (Vögel) p. 441, 1860.

This is the little grey-green bittern recorded by Schrenck from the Amur under the name *Ardea* (*Butorides*) *viriscens*, L. var. *scapularus*, Illig, but later described as distinct.

Considerably larger than any of the three foregoing species, this bird has the crown, and long crest of a glossy black; the sides and back of the neck, and the breast ashy grey; the throat

and middle of the lower neck whitish; the back slate-grey, with a green sheen; the wing-coverts black, with a green sheen, and edged with buffy-white; the primaries black, with white edgings at their tips; the tail black, with green sheen; the bill black; legs and feet green.

276. Night Heron.

Nycticorax nycticorax nycticorax, (L.).

Ardea nycticorax, L., Syst. Nat., I, pp. 237 and 239, 1766.

The night heron is a bird that is not often seen, though it is fairly common in these parts, where it breeds. La Touche records it at Chin-wang Tao, and I have seen specimens in the Tientsin district, and on the Upper Sungari in Kirin.

The bird may be recognized by its black crown, from which grows two long narrow white plumes; greyish-black back, which has a green sheen, grey wings; and white face, cheeks, neck, chest, breast and lower parts, washed on the neck with ashy-grey and on the breast with yellow; greenish bill and legs.

277. Cattle Egret.

Bubulcus coromandus, (Boddaert.)

Cancroma coromanda, Boddaert, Tabl. de Pl. Enl., p. 54, 1783.

This is a small heron, somewhat smaller than Swinhoe's *Herodias garzetta*. The head, neck, lower neck, and upper back plumes are of a rich golden-buff; the rest of the plumage is white; bill yellow; legs black. It probably finds it way as far north as Manchuria to breed, but is certainly not very common.

278 Chinese Pond Heron.

Ardeola bacchus, (Bonaparte.)

Buphus bacchus, Bonaparte, Consp. Av. II, p. 127, 1855.

This is another bird that probably occurs, though rarely, in the Manchurian Region.

It has the head and neck chestnut, darkening into purply-slate on the plumes of the lower neck, dark slate on the plumes of the upper back, and on the lower back, breast and tail; lower parts, wings and throat white; bill yellow with black tip; legs yellowish. Length about 20 inches.

In the immature plumage the head and neck are striped brown and pale buff; mantle and back-plumes dull grey-brown; the rest of the plumage white suffused with greyish-brown.

279. Eastern Reef-Heron.

Demiegretta sacra, (Gmelin).

Ardea sacra, Gmelin, Syst. Nat., I, p. 640, 1788.

The Eastern reef-heron, which also probably occurs in the Manchurian Region, is of a uniform dark slate colour, with a white throat. The bill is dark horn colour; legs blackish. Length about 20 inches.

280. Eastern Grey Heron.

Ardea cinerea jouyi, Clark.

Ardea cinerea jouyi, Clark, Proc. U.S. Nat. Mus., Vol. 32, p. 468, 1907.

The grey heron of Eastern Asia is almost identical with the European form, *Ardea cinerea*, from which it has been separated as a subspecies by Clark. The latter described the subspecies from specimens in Louis Jouy's collection of birds from Seoul, Corea. This eastern form is somewwhat lighter than the European bird, at the same time being a little larger.

The grey heron occurs plentifully all over North China and Manchuria. I saw its nests in the forested area of Western Kirin, near the crater lakes, described in Volume I. These nests were built high up in tall trees on the crests of the ridges that occurred in the neighbourhood.

James in "The Long White Mountain" records seeing an extensive heronry at the junction of the Sung-chiang and Sungari River in the Ch'ang-pai Shan region of South-central Kirin, where "thousands of herons and cormorants were nesting together in the willow-trees." One wonders what sort of a fish supply there must have been in the vicinity to feed so great, and hungry a horde!

La Touche records the first appearance of this bird at Chinwang Tao as on March 19th in 1911, March, 31st the following year, and March 20th the year ofter that.

So well known a bird as the grey heron needs no description here.

281. Purple Heron.

Pyrrherodias manillensis, (Meyen).

Ardea purpurea, var. manillensis, Meyen, Acta. Acad. Leop.-Carol XVI, Suppl. p. 102, and Reis. um die Erde, III, p. 226, 1831.

This handsome bird may at once be distinguished from the grey heron by its smaller size and distinctive colouring.

The crown and rather slight creast are black, which colour continues in a line half way down the back of the neck till it meets the grey of the back, which comes up this far; the sides of the head, and sides and front of the neck are a rich chestnut, lighter in front, a black line running down each side of the neck; the throat and chin are white; the plumes of the lower neck and chest are chestnut, black, white, and grey; the breast, and lower parts are black tinged with deep chestnut; the back and upper parts are slate-grey, tinged on the scapulars, and secondaries with green, the long plumes ending with chestnut; the inner surfaces, and fore part of the wing are chestnut; the primaries, and tail are a very dark grey, almost black.

This bird almost certainly occurs in Manchuria, though I believe it has not yet been recorded there. I secured specimens in the Tientsin district.

282. Great White Heron.

Ardea alba, L.

Ardea alba, L., Syst. Nat. I, p. 239, 1766.

When on the Yalu River in May and June, I saw a number of egrets, or white herons, and, though I did not care to shoot any of these beautiful birds myself, owing to the increasing danger of their being exterminated for the sake of their plumes —the popular 'ospreys' worn by ladies of fashion—my taxidermist surreptitiously shot one one day as we were sailing down stream. I could never make him understand why I did not wish to kill any of these beautiful birds. This bird turned out to be a specimen of the great white heron. (*Ardea alba*, L.)

Of a pure white colour, this species has the bill and legs black, the base of the bill and naked face green. It has in the breeding plumage fifty fine plumes that grow from the upper back.

Schrenck records this species from the Amur region.

The history of this and other species of egret in China is a sad one. Owing to the value of the plumes, which are worth from fifty cents to a dollar fifty a piece to the hunter, these beautiful birds have been cruelly persecuted by native gun-men, and the once extensive heronries on the Yang-tzu have been exterminated. As far as I can judge the great rivers of the Manchurian Region are the last safe breeding resorts for these birds, and these, too, are threatened, owing to the rapid opening up of the country. It is well known that the birds carry plumes only during the mating and breeding season, so that when the parent birds are shot, the young are left to die of starvation. The species that carry these plumes are doomed to extinction in Eastern Asia.

283. Yellow-billed Egret.

Herodias eulophotes, Swinhoe.

Herodias eulophotes, Swinhoe, Ibis, 1860, p. 64, and 1863, p. 418.

This egret has been recorded from Fusan in Corea, where Jouy secured a specimen in July 1883.

It is smaller than *alba* by a good deal, and may further be distinguished by its pale yellow bill, and smaller plumes. Otherwise the two species are much alike.

Family Ciconiidæ.

Two forms of stork occur in these parts, one the black stork (*Ciconia nigra*, L.), being fairly common, the other the Eastern white stork (*Ciconia c. boyciana*, Sw.) comparatively rare.

284. Eastern White Stork.

Ciconia ciconia boyciana, Swinhoe.

Ciconia boyciana, Swinhoe, Proc. Zool. Soc. Lond. 1871, p. 513.

There are three specimens of this rather rare stork in Louis Jouy's collection taken at Fusan in December, 1883, from which fact it may be gathered that the species winters in Southern

Corea. Thence it migrates into the Manchurian Region, where it has been recorded, as *Ciconia alba*, as occurring in the Amur region by Schrenck. Taczanowski also records it from Corea; while Campbell says it is common there.

This bird may be distinguished from the European stork by the fact that the outer webs of some of the primaries are partially white, the bare space in front of the eye is red, and the bill black. Otherwise the two forms are alike, the plumage being white, except for the flight feathers and tail, which are black.

285. Black Stork.

Ciconia nigra, (L.)

Ardea nigra, L., Syst. Nat., I, p. 125, 1766.

This handsome bird is much more common, at least in North China and neighbouring Manchuria, than the white stork. It may be seen during the migrations along the great rivers, or on the mud flats adjoining them; but as the summer advances it repairs to the mountainous regions, where it builds its nest on some ledge high up on the face of some inaccessible cliff. In certain parts of North China, where open springs occur throughout the winter, this bird may be found as a permanent resident.

It has the head, neck, chest, back, wings and tail black, the head and neck being suffused with a fine iridescent sheen, in which gold, green, crimson and purple give place to each other in varying lights; the breast, belly, and under tail-covert are white; the bill and naked face being orange-red; legs carmine.

Family Threskiornithidæ, or Ibidæ.

But one species belonging to the ibis family occurs in Manchuria, namely, the Chinese ibis (*Nipponia nippon*, Tem.) It is possible that other forms may occur there as occasional stragglers; but so far none have been reported.

286. Chinese Ibis.

Nipponia nippon (Temminck).

Ibis nippon, Temminck, Pl. Col., No. 551, 1838.

This species, which is extraordinarily plentiful in certain parts of China, notably in the west-central provinces, where it is a permanent resident, has been recorded from Corea, where Jouy collected specimens in December. It is possible that it breeds

in South Manchuria. I saw birds in the distance on the Yalu that I took to belong to this species. It is more likely that, as in South Shensi, where the bird is very plentiful, it breeds as well as winters in South Corea, and that only a few stragglers find their way up to the Yalu to breed.

It builds its nest in trees, much after the fashion of the herons and egrets.

The bird varies in colour from an ashy-grey to cream white more or less suffused with salmon-pink. In a specimen I have the upper parts are a light ashy-grey, the wings and tail being of a beautiful light salmon-pink, almost orange-pink on the flight feathers; while the lower parts are pale pink washed with grey; the face, chin, and crown are bare, and of an orange-red colour; the legs are the same; and the bill black. It has a crest on the back of the head, and a long curved bill, the legs and neck being shorter than in other members of the family.

It makes a noise exactly like that of a crow. Sometimes it may be seen flying at a considerable height, soaring in great circles, and performing evolutions as if in play. Its food consists largely of water snails and other *Mollusca*, which it finds in the swampy rice or "paddy" fields, and which it swallows whole.

Family Plataleidæ.

Two forms of spoonbill occur in the Manchurian Region. The members of the genus are easily recognizable by their peculiar bills, which are flattened out at the tips to resemble flat spoons or spatulas.

287. Common Spoonbill.

Platalea leucorodia, L.

Platalea leucorodia, L., Syst. Nat., I, p. 231, 1766.

While visiting the Fish-skin Tartars at Kao-er-tang, their village on the Lower Sungari River, near Fu-chin Hsien, I saw a young spoonbill belonging to this species, which the Tartars told me had been taken from its nest in the neighbouring marshes. We may thus put this bird down as breeding in the Manchurian Region without searching for further evidence on the subject.

It occurs in neighbouring North China, where I have seen it, while on migration, flying in the well-known V formation adopted by geese, ducks, and cranes. It breeds in Shansi and Chihli.

The bird is pure white in colour, slightly buffy on the neck. It has the bill and legs black, the base and tip of the bill being orange-yellow. There is a crest of white feathers on the back of the head. The length is 32 inches.

288. Lesser Spoonbill.

Platalea minor, T. & S.

Platalea minor, T. & S., Fauna Japonica, Aves, p. 120, 1847.

In Jouy's collection there is a young male of this species taken at Fusan; and it is probable that the bird occurs also in Manchuria.

It is like the foregoing, but is smaller, has a more naked face, the naked parts continuing on the forehead and cheeks to the eye: on the other hand, the naked part of the throat is much less extensive; while the whole of the bill is black, as well as the face, a yellow patch occurring in front of the eye, and a pink one under the eye.

Family Rallidæ.

To this family belong the coot, moorhen, rails, and crakes, all of which are aquatic in their habits, being inhabitants of marshes, ponds and lakes, and sometimes small rivers and streams. They are very different from any of the foregoing birds, having comparatively short bills, shorter necks, shorter feet, and proportionately much longer toes, lobed in some species. They all have some form of fleshy forehead-disc or crest, most pronounced in the water-cock (*Gallicrex cinerea*), and least conspicuous in the little Pallas' crake (*Porzana auricularis*). They are mostly good swimmers; and build their nests upon the ground amongst the reeds and rushes, or the long grass and low herbage of the areas they frequent. The family is represented in the Manchurian Region by some seven species.

289. Common Coot.

Fulica atra, L.

Fulica atra, L., Syst. Nat., I, p. 257, 1766.

So common a bird as the coot, which is exactly the same in these parts as in Europe, scarcely needs description. With its white bill and frontal-disc, its grey-green legs and feet, and broadly lobed toes, and its uniform dark grey plumage, it is

The Moorhen (*Gallinula chloropus*) in its natural haunts.

Photo by the Kodak Shop, Tientsin.

Tame common Cormorants in the Tientsin district, North China, used for fishing.

familiar at least to every European and American who knows the country, or has ever done any wild-fowl shooting.

The bird is extremely common throughout North China and the Manchurian Region, wherever marshes, swamps, lakes, and ponds occur, and may be met with along the rush-grown banks of all the rivers, even in forested areas. It may be seen in spring and autumn in large flocks.

290. Moorhen.

Gallinula chloropus, (L.)

Fulica chloropus, L., Syst. Nat., I, p. 255, 1766.

Though plentiful enough in these regions, the moorhen is less common than the coot, from which it may be distinguished by its smaller size, more olivaceous plumage, red bill and frontal disc, the former being tipped yellow, green legs, with smaller narrower lobes on the long toes, and its greater fondness for the land. In general shape and appearance it resembles the coot.

It occupies much the same sort of places as the coot; but as already stated occurs on land much more often, where, apparently, it finds a certain amount of its food.

It occurs throughout the Manchurian Region. La Touche records it under the name *Gallinula choloropus parvifrons*, Blyth.

291. Water-Cock.

Gallicrex cinerea, (Gmelin).

Fulica cinerea, Gmelin, Syst. Nat., I, p. 702, 1788.

La Touche records shooting a water-cock at Shan-hai-kuan, on the Sino-Manchurian frontier. Jouy secured a specimen at Fusan in Corea on June 28th; while Taczanowski also records it from Corea. These records are enough to show that the bird breeds in the Manchurian Region.

It is rather a large species, in which the male is dark grey streaked with black above, with a prominent crimson 'comb' on the forehead and crown in place of the frontal-discs of the coot and moorhen; the bill is yellowish-green; the legs and feet greenish; the eyes white.

292. Chestnut-breasted Crake.

Limnobœnus paykulli, (Ljungh.)

Rallus paykulli, Ljungh, Sver. Vet.-Akad. Handl. p. 258, 1813.

This crake is far from common in these parts. That it does occur in the Manchurian Region is evidenced by the fact that La Touche secured a specimen at Newchwang, South Manchuria.

It has the crown, nape, and upper parts olive brown; the throat white; sides of head, eyebrows, sides of neck, chest, and upper breast vinous-chestnut; lower breast, belly, sides, thighs, and under tail-coverts white, broadly barred black; bill greenish-grey; legs dull greenish. The length is about 12 inches.

293. Exquisite Crake.

Coturnicops exquisita, (Swinhoe).

Porzana exquisita, Swinhoe, Ann. and Mag. Nat. Hist., (4), XII, p. 376, 1873.

This beautiful little crake, which occurs in South China, probably also breeds in the Manchurian Region.

It has the upper parts olive-brown, with longitudinal rows of black double dots divided by light buff; the throat white; breast light brown, barred darker brown; belly whitish; lower flanks barred with black, bill short, and of a deep brown on upper mandible, greenish-yellow on lower; legs and feet light flesh-brown. The length is about 5 inches.

294. Pallas' Crake.

Porzana auricularis, (Reichenow.)

Ortygometra auricularis, Reichenow, Journ. f. Orn p. 139, 1897.

Rallus pusillus, Pallas, Reis. Russ. Reich., III, p. 700, 1776.

This charming little bird, which is no larger than the button quail (*Coturnix*), breeds in North China, Inner Mongolia and Manchuria. Ingram records it under the name *pusilla* from the Khingans in June, and Bianchi from Yin-k'ou (Newchwang), South Manchuria; while La Touche records it three times at Chinwang Tao. It is extremely common in the Tientsin district where I have secured a number of specimens.

The upper parts are of an olive-brown streaked with black and white. In the male the side of the head, throat, and breast are dark ashy-grey, the chin being white, and lower parts barred light grey and dusky. In the female the sides of the head, throat, and breast are a dirty white washed or flecked with light buff-brown on the cheeks and chest. The legs and toes are long, particularly the latter, and are of an olive-grey colour.

295. Eastern Water-Rail.

Rallus indicus, Blyth.

Rallus indicus, Blyth, Journ. As. Soc. Beng., XVIII, p. 820, 1849.

The water-rail is fairly common throughout the Manchurian Region. I saw it on the Sungari River in Kirin, and also on the northern bank near its junction with the Amur, but failed to secure specimens.

It closely resembles the British species (*Rallus aquaticus*), having the upper parts olive-brown, spotted with black, and the lower parts slate-grey, more or less barred on the flanks with dusky; the bill is a little shorter than in *aquaticus*, but otherwise the two birds agree in dimensions.

Family Colymbidæ, or Podicipetidæ.

The grebes are an interesting family of aquatic birds that are preeminently adapted for diving, and taking their prey under water. They spend the whole of their lives in the water except such time as the female is brooding. Their feet are peculiar, the toes being broadly lobed, while the tarsus is flatted in such a way as to offer the minimum resistance to the water when being drawn forward for each fresh stroke, the toes folding up at the same time like the ribs of a fan. The foot and toes bear an extraordinary resemblance to a three-lobed leaf. The neck is long; the bill usually slender and pointed, varying in length in the different species; the wings are small, and when the bird is swimming, are tucked well away beneath the flank and mantle feathers. The tail is practically absent, the retrices being reduced to a few hair-like shafts. The legs are set far back, and appear to stick out from the end of the body.

Though having such small wings, these birds can fly with considerable rapidity; and a small grebe in flight reminds one very much of a teal.

The family has five representatives amongst the birds that breed in the Manchurian Region.

296. Great Crested Grebe.

Colymbus cristatus, L.

Colymbus cristatus, L., Syst. Nat., I, pp. 222 and 223, 1766.

The handsome great crested grebe is of fairly common occurrence in North China and Manchuria in marshy districts and low lying swamps that border the great rivers. I saw some in the crater lakes in the Kirin forested area south-east of Ch'ao-yang Chên, where they were breeding. Here I found a nest, with five eggs which I managed to photograph. I saw the bird again on the marshes of the Lower Sungari near its junction with the Amur. Schrenck records *Podiceps subcristatus*, Jacq., from the Amur region.

This bird is one of the largest of its kind, measuring some 22 inches in length. It has the crown, crests, which stick out one on either side like horns, or ears, and a ruff of feathers round the neck of a rich chestnut brown fading into light buff and then white on the cheeks, and sides of the head; the back of the neck, back and wings are of a dark dusky-brown; the secondaries white; the front of the neck and under parts are pure white, with a fine gloss on the feathers; the bill is reddy-brown, yellow at the base; the legs and feet pale yellowish-green. The female is without the tufts and ruff, and is of more sombre plumage.

297. Eastern Red-necked Grebe.

Colymbus holbœlli, (Reinhardt).

Podiceps holbœlli, Reinhardt, Vidensk. Meddel., p. 76, 1853.

This bird is about 20 inches in length, and may be recognized by the chestnut-red colour on the front of the lower neck. The cheeks are grey; the breast greyish; and the upper parts brownish or dusky-brown. It has crests during the breeding season. In the winter plumage the upper parts are dark grey; the throat and lower parts white, flecked with grey. The bill is much heavier than in *cristatus*.

It has been recorded by Giglioli and Salvadori from Olga Bay on the Primorskaya Coast.

298. Black-necked Grebe.

Colymbus nigricollis, (Brehm).

Podiceps nigricollis, Brehm, Vög. Deutschl., p. 936, 1831.

Jouy's collection contains three specimens of this bird from Fusan, taken in December.

Like the great crested grebe, it has a very wide range, being recorded as a winter visitor in England, and occurring even in Africa.

It may be recognized by the crown, throat, cheeks, neck, and back of head being black, and the well developed ear-coverts rich chestnut gold; the upper parts blackish, shading into chestnut towards the tail; white on the breast and lower parts; the bill has a distinct upward turn. The winter plumage is greyish-brown above, and white below. Length, 12 inches.

299. Sclavonian Grebe.

Colymbus auritus, L.

Colymbus auritus, L., Syst. Nat., I, p. 222, 1766.

This bird is of a much darker colour on its upper parts than most of the foregoing. It has the superciliary tufts buff, and the foreneck chestnut; the bill also is compressed. It measures 13 inches in length.

I secured a female near Tientsin in September; while Clark records meeting it in Puget Sound in the North Pacific. It occurs from Western Europe, throughout Northern Asia to North America.

Schrenck records *Podiceps cornutus*, Lath., from the Amur region.

300. Eastern Dabchick.

Colymbus philippensis, (Bonnat).

Podiceps phillippensis, Bonnat, Tabl. Encycl. Méth., I, p. 58, pl. 46, fig. 3, 1790.

This, the smallest of the eastern grebes, is universally distributed over Eastern and North-eastern Asia, where it breeds wherever there are suitable marshes, or swamps, and even along the large rivers.

The male has the top of the head, chin, and back of the neck black; the rest of the upper parts very dark dusky-brown; the sides of the head and sides and front of the neck are deep chestnut; the chest dusky, and the breast white, flecked with dusky; the inner webs of the secondaries are white.

In the winter plumage, the black and chestnut of the head and neck disappear, the upper parts become lighter, and the breast a fine shiny white.

In habits this little bird agrees with the British dabchick.

Family Gaviidæ.

There are at least four species of diver that occur in the Manchurian Region. None of them are at all common in these parts, though there is evidence that these birds breed in certain parts of our region.

Though somewhat resembling the grebes, these birds are a good deal larger, and have webbed instead of lobed feet. They spend the winter at sea, or along the sea coast, only coming inland to breed.

301. Red-throated Diver.

Gavia septentrionalis, (L.)

Colymbus septentrionalis, L., Syst. Nat., II, p. 220, 1766.

Colymbus lumme, Gunnerus, Act. Nidr. I, pl. II, fig. 2, 1761.

This species of diver is the smallest of its family, though, even so, it is larger than any of the grebes. It has the upper parts of a greyish-black colour, with fewer white spots than is usual in the other species; the head and neck grey, the back of the neck being streaked with black and white, while the front has a triangular chestnut red patch in the male during the breeding season; the lower parts are white. It is about 20 inches in length.

Clark records this species in Puget Sound, and in the Bering Sea; while Jouy's collection contains two specimens taken at Fusan in March.

Captain H. J. Snow in his "Notes on the Kuril Islands" records this bird as being very common round those islands in spring, "when numbers are to be seen making their way northward along the islands. A few breed on Paramushir and Shum-

shir." Schrenck records it from the Amur region; while Dresser records it as seen commonly by the members of the Arctic Expedition on the Taimyr and New Siberia Islands, where it was nesting.

302. Black-throated Diver.

Gavia arctica, (L.)

Colymbus arcticus, L., Syst. Nat., I, p. 221, 1766.

The black throated diver, which Clark recorks at Petropaulski, in Kamschatka, may be recognized by its light grey head; black and white striped gorget, purplish-black patch on the front of the neck; and black upper parts, closely spotted with white in longitudinal bands between the shoulders and on the scapulars. It is much larger than the foregoing, being about 27 inches in length.

Schrenck records *Colymbus arcticus*, L., from the Amur, and Buturlin *Urinator arcticus* from the Ussuri region. Leonard Stejneger also gives it in his list of birds of the Kuril Islands.

303. Pacific Diver.

Gavia pacifica, (Lawrence).

Colymbus pacificus, Lawrence in Baird's B. N. Amer. p. 889, 1860.

According to Clark this bird occurs in the Kurils, two being seen "near the beach at Simushir," while Buturlin records it as *Urinator pacificus* from the Ussuri region.

This is a near relation of *Gavia arctica*, which it closely resembles, differing in the paler colourng of the nape, and back of the neck; while the fore-neck reflects a deep blue or green. The crown and nape are grey; the foreneck and back black, streaked on the throat and sides of the neck with black, and on the back with white. It is also a smaller bird, being 24 inches in length.

304. Great Northern Diver.

Gavia glacialis (L).

Colymbus glacialis, L., Syst. Nat. I, p. 221, 1766.

Colymbus immer, Brünnich, Orn. Bor., p. 38, 1764.

The upper parts, including the head and neck, are glossy black; the throat and neck streaked with white; the back and wings are marked with regular rows of spots, or short bars of white; chest and under parts white. The length is 30 inches. The bill is blackish.

There seems to be some doubt as to the occurrence of this bird in our region, though Stejneger gives it in his list of Kuril birds under the name *Urinator umber* (Gunnerus), at the same time ignoring Snow's record of *Colymbus adamsi*. It is not safe to say definitely that *glacialis* does not occur in these regions, for one can never be sure about these birds that inhabit Arctic Seas; but it seems probable that its place is taken in the North Pacific by our next species, *adamsi*.

305. Great White-billed Diver.

Gavia adamsi (Gray).

Colymbus adamsi, Gray, Proc. Zool. Soc. Lond. 1859, p. 167.

This is the largest of the divers, measuring 32 inches in length. It closely resembles *G. glacialis*, in its plumage, but may be distinguished at once by its larger bill, which is of a yellow, or ivory-white, colour and has a distinct upward bend.

The species is well known in these parts. Snow records it from the Kurils, and Dresser as breeding in the Arctic; while specimens have been taken far south on the China Coast.

Family Phalacrocoracidæ (Cormorants and Shags).

The cormorants are a well known family of aquatic birds, whose power of fishing are second to none in the birds that obtain their living by this means. There are a large number of species, some of which represent types that go far back into geological times, thus showing the group to be a very old one. Some of the species are almost entirely inhabitants of the coastal regions, deriving their livelihood from the sea, while others keep more to inland waters; though of the latter many members may also be found on the coasts, in the estuaries of large rivers, and even some distance out at sea.

Five species are included in our list.

306. Common Cormorant.

Phalacrocorax carbo, (L).

Pelecanus carbo, L., Syst. Nat., I, p. 216, 1766.

The common cormorant is the only member of the genus that is common in Manchuria. I came across it everywhere on the larger rivers, where it is able to get a plentiful food supply. This

was doubtless the species that James saw nesting in such numbers near the junction of the Sung-chiang with the Sungari in the Ch'ang-pai Shan district of Kirin.

In the adult the plumage is a glossy black except for the cheeks and sides of the neck, and a spot on the side of the abdomen, which are white, and some white streaks on the back of the head and nape. The bill is brownish; the bare parts of the face yellowish; the eyes a fine emerald green; the legs black. Its length is 36 inches.

307. Temminck's Cormorant.

Phalacrocorax filamentosus, (T. & S.)

Carbo filamentosus, T. & S., Fauna Japonica, Aves, p. 129, 1847.

Recorded by Clark as common about the shores of Matsushima, and taken by Jouy at Seoul and Chemulpo, this cormorant doubtless occurs in Manchuria at least along the coasts. It may be recognized by the fact that the bare portion of the face does not extend posteriorly beyond the gape of the bill; there is less white and the scapulars and wings with a bronzey-green sheen.
on the head and neck; the gorget is streaked with a green sheen;

Its length is about 33 inches, the species thus being a little smaller than *carbo*, which it very much resembles.

308. Red-faced Cormorant.

Phalacrocorax urile (Gmelin)

Pelecanus urile, Gmelin, Syst. Nat., I, pt. ii, p. 575, 1788.

This cormorant, or shag, may be recognized by its double crest, one on the forehead and the other on the back of the head, and in its having the forehead feathered to the base of the bill. It is black in its plumage, with a fine metallic sheen, which is green and purple on the upper parts, blue on the head and neck, and green on the belly. There is a conspicuous white patch on the side of the rump. Length, 34 inches.

Stejneger gives it in his list of birds of the Kuril Islands; while Clark records it off the Northern Kurils.

309. Pigmy Cormorant.

Phalacrocorax pygmæus (Gmelin.)

Pelecanus pygmæus, Gmelin, Syst. Nat., I, pt. ii, p. 574, 1788.

In this bird the forehead, lores, feathers surrounding the eye and naked throat are white, the head and neck black. The plumage of the body is black, with a green sheen, the scapulars and wing-coverts are dark grey, the feathers being edged with black, and narrowly fringed when freshly moulted with white. There is a tuft of white hair-like feathers above the ear.

The bill and legs are black. Length, 22 inches.

This, one of the smallest of the cormorants, occurs in the Kurils, and probably also along the Manchurian Coasts.

310. Pelagic Cormorant.

Phalacrocorax pelagicus, Pallas.

Phalacrocorax pelagicus, Pallas, Zoogr. Ross.- As. II, p. 303, pl. LXXVI, 1811.

This bird has been recorded by Buturlin under the name *Graculus pelagicus* from the Ussuri.

It has the forehead feathered; back feathers not marginated; the general colour is black, with green and purplish sheen above, and a green sheen below; it has long white plumes on the neck, lower back and rump in the breeding season, with a crest on the forehead, and white patch on the side of the rump. The length is 28 inches.

La Touche records seeing what he took to be a lesser frigate-bird (*Attagen minor*, D. & O.) flying about over the harbour at Chin-wang Tao, but as he failed to secure a specimen, and so definitely identify the species as occurring in these parts, I have not included it in our list of birds of the Manchurian Region. *

* Recently (1924) Mr. H. W. Hubbard secured a specimen of the frigate bird at Pei-Tai Ho.

CHAPTER VIII.

Birds of Passage.

But the night is fair,
And everywhere
A warm, soft vapour fills the air,
And distant sounds seem near;
And above, in the light
Of the Star-lit night,
Swift birds of passage wing their flight,
Through the dewy atmosphere.

I hear the beat
Of their pinions fleet,
As from the land of snow and sleet
They seek a southern lea.
    I hear the cry
    Of their voices high,
Falling dreamily through the sky,
But their forms I cannot see.

—*Longfellow.*

CHAPTER VIII.

Birds-of-Passage.

The birds which we now have to consider are what are generally known as birds-of-passage, that is to say, those that only pass through a country on their way to and from their breeding grounds in the far north, and that winter in sub-tropical climes, or even in areas in the Southern Hemisphere.

Here again it is noticeable, that, as far as the Manchurian Region is concerned, the birds of this great group consist of whole families, and even orders, rather than of a heterogenous mixture of individual species.

Thus we find that all the cranes (*Megalornithidæ* or *Gruidæ*) are birds-of-passage, as also are most of the ducks, geese, and swans (*Anatidæ*), the plovers (*Charadriidæ*), and the snipes and sandpipers (*Scolopaciidæ*), with which may be included the few members of such isolated families as the oystercatchers (*Hæmatopodidæ*), the turnstones (*Arenariidæ*), the phalaropes (*Phalaropodidæ*), and the pratincoles (*Glareolidæ*). Between them these families contain a great many species, and, in order to facilitate the handling of them, I have decided to deal with the *Anatidæ* in a separate chapter, under the popular heading of wild-fowl.

One is fully aware of the fact that certain species and many individuals of others belonging to the above families actually breed in the Manchurian Region. Notably is this the case with the *Charadriidæ*, and *Anatidæ;* but, as already stated, it seems better to deal together with whole groups and families of birds that have common habits, mentioning, as we come to them such species as do not conform to the general rule, than to split up the families by isolating the exceptions, and considering the latter along with other families, with whose habits they agree.

The birds-of-passage are in many ways the most wonderful members of the whole feathered world. Their enormous journies between their winter resorts and their breeding haunts are a never failing source of wonder. Their immense single flights, in some

cases extending over distances of thousands of miles, are even more wonderful, when we come to consider them; while the tenacity of purpose and persistancy with which they stick to certain breeding haunts, and equally or even more limited winter resorts constitutes another of the marvels of the bird world.

As time goes on, and more and more facts regarding the habits, times and seasons, and resorts of these birds are brought to light, our knowledge may increase sufficiently to enable us thoroughly to understand the many problems that now confront us; but even then the facts will lose none of their wonder, indeed, it is more likely that the wonder of them will be increased.

Of course, the mere fact that such journeys are undertaken by the birds-of-passage argues that they are gifted with unusual powers of flight, and it will be found that this is the case. They are not only flyers of great endurance, but also of considerable speed, and it is probable that amongst their ranks will be found the speediest members of the bird world.

Sportsmen will naturally be interested in this great group of birds, for apart from the wild-fowl it contains some of the most highly prized birds of the chase, such as the snipe and woodcock; while it also furnishes them with that particular form of sport known as shore-shooting, which is so popular in the United States. The shore-birds—plovers, sandpipers, turnstones, godwits, whimbrels, curlews, and the like—are all birds-of-passage; while, to such as care to shoot them, the cranes will always offer very fair sport.

Family Megalornithidæ (Cranes).

The first family belonging to our present group is that of the cranes. These are not commonly seen in the Manchurian Region itself, since, in common with so many other migrants, they travel chiefly at night. Their calls, as they pass overhead may be heard; but when day comes they seek some isolated mud-flat or wide swamp in which to rest. They thus seem to keep mainly to the courses of the large rivers, or else follow the coast line, or even the islands that traverse the adjacent seas, while on migration.

With the exception of the demoiselle crane (*Anthropoides virgo*), which breeds in Mongolia, most, if not all the cranes resort to the Siberian tundras to breed.

Though so comparatively rare in the Manchurian Region, these birds are well known in the regions where they spend the winter, such as Central and South China, Japan, and more tropical countries.

With their large size, long, slender necks and legs, rather long bills, and usually handsome plumes on the wings that hang down over the tail, the cranes may easily be recognized; though many people mistake herons and storks for these birds. Indeed they bear some outward resemblance to the latter; though in reality the two groups of birds are in no way connected.

311. Demoiselle Crane.

Anthropoides virgo, (L.).

Ardea virgo, L., Syst. Nat., I, p. 234, 1766.

This handsome crane, which is the smallest of the species that are known to occur in Manchuria, may be recognized by its small size, comparatively short bill, neck and legs, and the long lanceolate feathers of its lower neck and chest. It has the face, fore-neck, and breast-plumes of a greyish-black, with a white tuft of rather long feathers on either side of the head, projecting backward from just behind the eye; the rest of the plumage, except the ends of the long tertiaries, the flight-feathers, and tail, which are greyish-black, is of a soft ash-grey. Unlike most of the cranes it has no bare patches on the head.

The bird is extremely common on the Mongolian Plateau, in the Ordos Desert, and also in Eastern and North-eastern Mongolia, whence it spreads into Manchuria. Here it occurs during the summer in pairs, and during the spring and autumn in large flocks, at which times it may be seen going through extraordinary antics as though dancing. Indeed when a whole flock is thus engaged, wings extended, necks being raised and lowered, each bird jumping wildly up and down, or running to and fro, the spectacle is that of a war dance of feathered savages. At such a time every bird repeats at the top of its voice its not unmusical call, till the air rings with the noise. This peculiar habit is not confined to the demoiselle crane, for I have witnessed it also in the common crane, which is plentiful in these parts.

The demoiselle crane is more of a "steppe" or desert inhabiting bird than the other species, and as such belongs really to the Mongolian avi-faunal sub-region.

312. White-naped Crane.

Pseudogeranus leucauchen, (Temminck).

Grus leucauchen, Temminck, Planches Coloriées, No. 449, 1827.

The white-naped crane, so called on account of its having the back of the head and neck white, while the rest of the plumage except the white throat, is dark grey, has the fore part of the crown and the sides of the face bare, and crimson in colour.

It probably visits Manchuria in summer, for there are three specimens of the species in Jouy's collection from Corea, two of which were taken at Fusan in the winter. These must have passed through some part, at least, of Manchuria, on their way south from their breeding grounds in Siberia. Taczanowski also records specimens from Corea.

313. Great White Crane.

Leucogeranus leucogeranus, (Pallas).

Grus leucogeranus, Pallas, Reise Russ. Reiche. II, p. 438 & 714, 1776.

The great white crane may be recognized at once by its pure white plumage and black quills, the naked parts of the head and face and the legs being crimson-red.

Dresser reports on the authority of the members of the Russian Arctic Expedition that this bird occurs in summer on the Yansk tundras, and according to the natives breeds as far north as Cape Sviatoi Nos, and the Yana Estuary. Two eggs usually are found in one nest.

Schrenck records the species from the Amur region.

314. Manchurian Crane.

Megalornis japonensis, (Müller).

Ardea (*Grus*) *japonensis*, Müller, Natursyst. Suppl. p. 110, 1776.

Under the name of *Grus montignii*, which is incorrect, James records what he called the Manchurian crane as occurring in large numbers in the marshes beyond Petuna during September. Petuna lies on the Sungari to the south-west of Harbin, where that river

flows for a short while through the northern part of the West Manchurian plain. Poliakow, also, records it from the Ussuri. As the species is known to breed in Eastern Siberia and winter in Japan, these records must have been made of birds on migration. Indeed the bird is so common in Manchuria during the migratory seasons, that it has become known generally as the Manchurian crane.

The plumage of the body is white, except for the primaries, plumes, forehead, throat, upper foreneck, and lower hind-neck, which are black. The top of the head is naked, and of a crimson colour. It may thus be readily distinguished from the great white crane (*Leucogeranus*), from which it further differs in being smaller.

315. White-headed Crane.

Megalornis monachus, (Temminck).

Grus monacha, Temminck, Planches Coloriées, No. 555, 1835.

This crane is recorded from Corea, two specimens having been taken by Jouy at Fusan in December.

It has the head entirely feathered, the forehead being black in the adult, white speckled with black in the immature plumage. The head, hind neck, and nape are white washed with rufous in the immature bird, the rest of the plumage being grey, the quills greyish-black.

316. Eastern Common, or Grey, Crane.

Megalornis grus, (L.)

Ardea grus, L. Syst. Nat. I, p. 254, 1766.

This is the commonest crane in these parts, passing through Eastern China and Western Manchuria in great numbers during the migrations. The species winters on the Yang-tzu, in Southern Shansi, and in Shensi along the Wei Valley. I have seen it flying very high in immense 'skeins,' numbering sometimes as many as 150 individuals. I have also encountered it in Anhui Province north of the Yang-tzu in February, where it was feeding in flocks on the low rolling hills.

It has the top of the head bare of feathers, and of a dull crimson colour. The cheeks, and sides of the head and neck are white; the flight feathers grey-black; the rest of the plumage a dull slate grey.

Schrenck records it as *Grus cinerea* from the Amur.

Family Charadriidæ (Plovers and Lapwings).

As a family the plovers and lapwings are more inclined to stop off and breed at suitable places before getting to their usual breeding haunts in the far north than most other birds-of-passage. At the same time there are amongst their numbers some of the most wonderful travellers in the bird world, wintering as they do in the tropics or southern hemisphere and breeding in the far north, and traversing the intervening distances by tremendous flights. For instance, according to a statement in the Royal Natural History it is believed that the dotterels accomplish their enormous flight from Africa to the Arctic tundras in a single night. The basis for this belief is that of the countless thousands of individuals that leave Africa and arrive in the Arctic, only a comparatively few are seen in the intervening countries. Since the distance from the northern shore of Africa to the northern parts of Norway is over 2000 miles, this means that to accomplish this feat, a dotterel must travel at something between 160 and 180 miles an hour.

In the East the representative of the European dotterel (*Octhodromus veredus*) travels from Australia to Northern Siberia, and is even more seldom seen in intervening countries than is the case with the western form, so that it is not unreasonable to suppose that it makes even greater flights.

Another species that is known to cover a tremendous distance during its migration is the American golden plover, which is said to breed in Alaska and winter in the Argentine, travelling on its south-bound journey first 3000 miles east and then 6000 miles south; while its near relative, the Eastern or Pacific golden plover, which breeds also in Alaska, as well as along the northern shores of Siberia, travels, in the case of the Siberian birds, an equally long journey by skirting the East Asiatic coasts and reaching the South Pacific islands by way of the East Indies and North Australia, and, in the case of the Alaska birds, direct to Hawaii in a single

flight of 3000 miles across the open sea, which offers no intervening landing or resting place. As the golden plover is one of the fastest known birds, and travels probably at well over 150 miles an hour, this great flight is probably accomplished in something under 20 hours. One cannot but marvel at the wonderful machinery or mechanism possessed by such birds to sustain them on a flight of this nature.

There are some twelve species belonging to the *Charadriidæ*, which pass through the Manchurian Region during the migration, of which one, at least, is a regular breeder in that country, while several others may be suspected of stopping off irregularly to breed in suitable localities.

317. Lesser Sand Plover.

Ægialitis alexandrina (L.)

Charadrius alexandrinus, L., Syst. Nat., I, p. 258, 1766.

The lesser sand plover, or as it is often called, the Kentish plover, being the *Ægialitis cantianus*, L., of many authors, is one of the few members of the great group usually known as shore-birds that breeds in temperate regions. It may be met with throughout the summer along the entire coast of North China and South and East Manchuria wherever there are suitable breeding grounds. It breeds also in the marshes and in river beds and valleys at considerable distances inland. In the summer of 1916 my collector secured several pairs that were undoubtedly breeding on the sandy and grassy flats that lie between Pei-tai Ho and Chin-wang Tao on the northern shore of the Pe-chi-li Gulf.

Mr. La Touche records it under the name of *Ægialitis cantianus* at Chin-wang Tao from April 12th to 29th as a migrant; but I am strongly of the opinion that it is a regular breeder in these parts.

This plover measures 6¾ inches in length. It has the face, eyebrows, throat, sides of neck, chest, lower parts, and the two outer feathers of the tail pure white; the forehead is black, the crown and back of head light chestnut, a black band passing from the base of the bill through the eye; there are two black patches on the sides of the chest, and the flight feathers are black; the rest of the plumage is of a greyish-brown. The bill and legs are black.

318. Lesser Ringed Plover.

Ægialitis dubia (Scopoli).

Charadrius dubius, Scopoli, Del. Fauna et Flora, Insubr. II, p. 93, 1786.

I secured specimens of this little ringed plover in Tientsin and also on the Yalu River, South Manchuria. There is reason to believe that it breeds in the valley of the latter, as well as elsewhere in Manchuria, for I saw many couples on the sandy stretches along the Yalu as late as June, and also along the Upper Sungari and its tributaries during July.

Jouy collected specimens at Seoul on June 25th and September 18th, one from Gensan on July 25th, and two from Fusan on December 25th, from which it would seem that the species is to be found in Corea all the year round, wintering as well as breeding there.

On the other hand large numbers must pass through these regions to more northerly breeding grounds.

La Touche records what is probably this species under the name *Æ. minor* at Chin-wang Tao, but not in great numbers, from April 11th to May 25th, while I have met with it in the Tientsin district when snipe shooting much earlier than this.

It may be recognized by the complete black band round the chest and neck, the dark upper parts, absence of any chestnut or reddy-brown on the head, and the complete white collar. The black band across the eyes and face is broader than in the foregoing species, and there is less white on the face. This bird must not be confused with Hodgson's ringed plover (*Æ. placida*), a larger bird, which it closely resembles in its plumage. The lesser ringed plover is about 6½ inches in length, that is, a little smaller even than the lesser sand plover. The bill is black; legs flesh-coloured.

319. Hodgson's Ringed Plover.

Ægialitis placida (Gray).

Charadrius placidus, Gray, Cat. Mamm. etc. Nepal Pres. Hodgson, p. 70, 1863.

This bird, which as already stated, resembles the lesser ringed plover, may only be distinguished by its larger size, being about an inch and a half longer, and by the fact that its outer tail

feathers are more than a quarter of an inch shorter than the central pair, that is, it has a more wedge-shaped tail. Its length is 8 inches; bill blackish-brown, with the basal part of the lower mandible orange yellow; legs pale yellowish-brown.

La Touche records two of these birds, apparently paired, on May 28th inland from Chin-wang Tao. He subsequently wrote me that he had secured several clutches of its eggs, presumably from the same place, or some adjacent valley.

I secured a specimen of this bird in April in Tientsin, and James secured one in Manchuria at Ssu-tao-chiang on June 17th, 1886, from which it may be supposed that the species breeds in that country as well as neighbouring North-east China. I also saw this bird on the Upper Sungari, where it occurred with the lesser ringed plover on the sandy or shingle beaches and bars. Jouy secured a single specimen at Seoul in Corea in October.

320. Greater Sand Plover.

Ochthodromus geoffroyi (Wagler).

Charadrius geoffroyi, Wagler, Syst. Av. Charadrius, p. 61, No. 19, 1827.

This plover is more commonly met with than the foregoing, which it closely resembles. It may be distinguished at once by its greater size, and the entire absence of any black ring or gorget on the chest.

It has the top of the head, nape, sides of neck, and chest of a light chestnut, a black band across the forehead being divided from the usual black band across the eyes and the bill by a narrow white band. The throat and cheeks are white, as also are the lower parts including the under tail covert and the two outermost tail feathers. The tips of the other tail feathers excepting the two central ones, the tips and outer edges of the secondary wing coverts, and the outer edges of the secondary flight feathers also are white. The back, wing coverts, and central tail feathers are a greyish brown, the quills being blackish-brown. The bill and legs are black: length 8¾ to 9 inches.

I secured two specimens of this bird on the Mongolian Plateau north of Kalgan in August, and another in worn breeding plumage at Pei-tai Ho, (near Chin-wang Tao) on July 20th, from which it may be supposed that the species occasionally breeds locally. La Touche records it at Chin-wang Tao.

321. Mongolian Sand Plover.

Ochthodromus mongolus (Pallas).

Charadrius mongolus, Pallas, Reis. Russ. Reichs, III, p. 700, 1776.

The Mongolian sand plover has the crown, back of head and neck, and the chest of a light chestnut colour; the throat and under parts white, with a little white on the face just above the bill, surmounted with black. There is also a black band across the eye and a black ring or gorget between the white of the throat and the chestnut of the chest and upper breast. It is between 7 and 8 inches in length.

It differs from *O. geoffroyi* in being smaller, with a shorter bill and tarsus, and in having the black eye-band broader.

This bird is not very common in these parts, though it has been recorded by La Touche at Chin-wang Tao, and by Jouy, who secured a single specimen at Gensan in Corea. Ingram records it from Kirin Province (probably on the plains), a specimen having been taken on August 22nd, still in its breeding plumage; and Giglioli and Salvadori record it from Olga Bay on the Manchurian coast. It has been recorded also from the Kuril Islands.

322. Gould's Sand Plover.

Ochthodromus pyrrhothorax (Gould).

Charadrius pyrrhothorax, Gould, Birds of Europe, IV, pl. 299, 1837.

This plover, which is a Central Asian species, but which may possibly occur in Western Manchuria where that country meets the 'steppes' of Eastern Mongolia, is very similar to *O. mongolus*, but is paler in general colour, especially the chest-band. The black band on the forehead is united with the black ear coverts, the forehead also being entirely black. Length 7½ inches.

323. Oriental Dotterel.

Ochthodromus veredus (Gould).

Charadrius veredus, Gould, Proc. Zool. Soc. Lond., 1848, p. 38.

The Oriental dotterel differs from the European species in having the third toe shorter and the abdomen white in the summer plumage instead of black.

The crown and back of the head are a brownish-black, the back, wings, two central retrices (tail-feathers) and the chest being dusky-brown, with rusty edgings to the feathers of the wing-coverts. The broad white eyebrows commence at the base of the bill and meet on the nape: the chin, throat, and cheeks also are white, the side tail feathers being broadly tipped with white. Below the dusky brown of the chest comes a band of buffy white, while the breast and flanks are a rich chestnut, the lower parts, including the tail-coverts being white. Bill brownish with dark tip; legs brownish flesh-coloured. Length 8½ inches.

This bird, as already stated, breeds in Arctic Siberia, wintering from Java to Australia, and is very rarely seen in the intervening countries.

324. Asiatic Sand Plover.

Ochthodromus asiaticus (Pallas).

Charadrius asiaticus, Pallas, Reis. Russ. Reichs, II, p. 715, 1773.

This is another Central Asian plover which may occur at least in Western Manchuria. It is very like *O. veredus*, but differs in having a black gorget, white axillaries, and only a narrow white edging to the tail quills. Length 7 inches. Bill black; legs greenish.

325. Eastern Golden Plover.

Charadrius dominicus fulvus, Gmelin.

Charadrius fulvus, Gmelin, Syst. Nat. I, p. 687, 1788.

The Eastern, or Pacific, golden plover is one of the more common of the birds-of-passage in these parts, or, at least, it is better known and more often seen by sportsmen generally, because it stops off to rest and feed in large flocks along the more coastal regions of North China and Manchuria. Sportsmen when out after snipe or duck in the marshes keep a sharp lookout for this bird, because it is considered a delicacy; while the speed with which it flies makes it a difficult and therefore sporting mark. Every season a number of these birds are shot by sportsmen in the Tientsin and Newchwang districts, while they are generally to be found, in both

spring and autumn in the local game markets. During a number of years' observation in the Tientsin district I saw flocks of these birds every season; and on more than one occasion saw flocks that must have consisted of upwards of a hundred individuals.

Ingram reports four specimens having been secured at Chuchia-tai, on the North Kirin plain, on August 22nd to 27th, to which he gave the name *dominicus*, but which must have been the present species. He describes them as changing into the black and white winter dress! Jouy secured one specimen in Corea.

Bianchi records a specimen shot by Captain Karpow on September 10th at Ying-kow (Newchwang), and Giglioli and Salvadori record the species from Olga Bay, the latter also recording *C. dominicus*, one specimen of which they say was obtained.

The members of this species do not stop off to breed locally, but pass right on to the tundras and shores of Northern Siberia beyond the timber belt.

This eastern form differs from the European species only in point of size, it being an inch shorter in length.

In its full breeding plumage it is a most handsome bird. The crown, nape, back, wings and tail are black, thickly spotted with a rich, rather brassy or golden yellow, while the face, cheeks, front of the neck, chest, breast and belly are black, a whitish line dividing the yellow-spotted upper parts from the unspotted lower parts. The bill and legs are black. Length 10 inches.

The female is of a uniform greyish colour spotted with greyish yellow.

The above mentioned records of *C. dominicus*, the American golden plover seems doubtful; for this bird ranges from the northernmost shores of America to Argentina, its place being taken in Eastern Asia by our subspecies *fulvus*, which, however, breeds also in Alaska, south of the Bering Straits.

326. Grey Plover.

Squatarola squatarola (L.)

Tringa squatarola L., Syst. Nat. I, p. 252, 1766. Scopoli Ann. I, p. 101, 1769.

The grey plover, or, as it is known in America, the black-bellied plover, is somewhat larger than the golden plover, and has the yellow of the upper parts replaced by grey or white, the lower parts being black, excepting the lower abdomen and under tail

covert, which are white. The bird is 12 inches in length. Bill and legs black.

It is mentioned as occurring in the Kuril Islands by Snow. La Touche records it at Chin-wang Tao, but strangely enough does not mention the golden plover. The latter is a very much more common species in these parts. Buturlin records *Squatarola* from the Ussuri, and Giglioli and Salvadori mention it as from Olga Bay and Corea.

327. Lapwing.

Vanellus vanellus (L.)

Tringa vanellus, L., Syst. Nat. I. p. 258, 1766. *Vanellus cristatus* Wolf and Meyer.

The lapwing, peewit, or crested plover is by far the commonest of the plovers in these parts. It is one of the earliest of the water fowl to appear in spring, following immediately on the break up of the severe frosts. I have taken specimen near Tientsin as early as March 6th, when there was still a considerable amount of ice about, and long before either wild-fowl or snipe were to be had, with the exception of a few stray teal. La Touche records this species on March 10th at Chin-wang Tao. It occurs all through the spring in large numbers, the last few taking their departure northward about the end of April or beginning of May. It does not apparently stop off to breed in Manchuria, but goes right on to the tundras of Northern Siberia.

So well known a bird as the common lapwing hardly needs description here. It may always be recognized by its dark upper parts with their rich olive green sheen, its long crest, black breast, white under parts, black and white tail and wings and Chestnut under tail covert.

The flight is unlike that of any other plover in these parts except the so-called grey-lapwing (*Microsarcops cinereus*), for it is slow and jerky, or irregular, more like that of a gull hovering over a pond.

Though no larger than the foregoing species, being 12 inches in length, this bird by reason of its large, broad wings certainly appears larger. The Chinese in the Tientsin district call the lapwing *Shao-pien-er*, which means "little pig-tail, or queue," and has reference to its crest of long thin black feathers.

328. Grey Lapwing.

Microsarcops cinereus (Blyth).

Pluvianus cinereus, Blyth, Journ. As. Soc. Beng., XI, p. 587, 1842.

Though somewhat resembling the common lapwing when in the air, the grey lapwing, or cinereus plover, as it is sometimes called, is a very different bird when examined more closely. It is a larger bird, measuring about 14 inches in length, and has very long yellow legs. The base of the bill is yellow, the tip black, and there are two yellow fleshy appendages on the face in front of the eyes. The head, which has no crest, together with the neck, back and wing coverts are grey, the flight feathers and retrices being black and white, much as in the common lapwing. There is a black band across the chest, below which the breast and lower parts are white.

This bird, though common enough in these parts, is not so numerous as the peewit, which it resembles in its habits to a large extent. It is the largest of the plovers that occur in North China and the Manchurian Region. The flesh, though edible, is not very palatable, being somewhat coarse and strong flavoured.

La Touche records the species at Chin-wang Tao, but not frequently. It is very common, however, during the migratory seasons throughout North China, Inner Mongolia and Western Manchuria at least.

Family Glareolidæ (*Pratincoles*).

To this family, which is related to the plovers or *Charadriidæ* on the one hand, the coursers on the other, we have but a single species represented in the avi-fauna of our general region.

329. Eastern Pratincole.

Glareola orientalis, Leach.

Glareola orientalis, Leach, Trans. Linn. Soc., XIII, p. 132, pl. 13, fig. 1 and 2, 1820.

One of the commonest birds-of-passage to be met with during the spring and autumn in North China and Southern Manchuria is the pratincole. This bird occurs whereever there are marshes or swamps in great numbers, feeding, apparently, on the various

forms of insect life, which it takes for the most part in mid-air. I have, however, often seen it feeding on newly ploughed fields adjacent to the marshes.

Though passing on to Siberia and elsewhere in the north to breed, it not infrequently stops off in suitable localities for that purpose. I have seen birds during the summer in both the Pei-tai Ho and Tientsin districts, and actually secured an immature female in the latter place in July 1914.

A bird that keeps almost entirely in the air during daylight, the pratincole resembles the swifts and swallows in its graceful flight, swooping, darting, diving, rising and wheeling continuously in a wonderful way. Indeed, the Chinese call it *T'u-yen-tzu*, meaning "earth swallow," on account of its resemblance to the swallows, which is further enhanced by its forked tail.

It has the upper parts, including the crown and nape, as well as the chest and upper breast, brown, the under surface of the wings rich chestnut; the throat buff, edged with black; the lower breast, belly, thighs and under tail-covert white. The wings are long and pointed: the bill strong, short, inclined to be hooked, and of a brownish colour; the gape is wide, the edges being scarlet; the legs are brownish-black.

Family Hæmatopodidæ (Oystercatchers).

In this family we have some four species to deal with, which present rather widely different appearances amongst themselves. They are rather large birds, all of striking appearance, and somewhat unusual or peculiar habits.

330. Eastern Oystercatcher.

Hæmatopus osculans, Swinhoe.

Hæmatopus osculans, Swinhoe, Proc. Zool. Soc. Lond. 1871, p. 405.

The eastern oystercatcher undoubtedly breeds in the Manchurian Region, finding, as it does, suitable surroundings in the swamps and low-lying grass-lands that border the Amur and Sungari Rivers close to their junction, and towards the mouth of the former. I saw several of these birds on the banks and sand-bars of the Sungari in July, and was told by the local inhabitants that they were very common.

Bianchi records the bird at Ying-kow (Newchwang) at the mouth of the Liao River on May 8th, and La Touche at Chin-wang Tao as late as May 24th. It has been recorded also by Buturlin from the Ussuri, while Jouy's collection contains specimens from Chemulpo in Corea taken in September, and one from near Fusan taken early in November, where, doubtless it winters.

Having the head, neck, back, terminal portion of the tail, upper wing-coverts, and most of the flight feathers black, the basal portion of the tail feather, the secondary wing-coverts, and the whole of the lower parts white, the eastern oystercatcher differs from the western species *H. ostralegus* in having no white on the primaries till the sixth quill, and also in having a longer bill. The latter, together with the legs is orange-red colour. The two forms agree in size, as well as in habits.

The oystercatcher is *par excellence* a shore-bird, especially during the winter, when it may be seen seeking its food on the rocks at low tide; but, as has been shown, it frequents the large rivers of the interior as well.

331. Black-winged Stilt.

Himantopus candidus, Bonnat.

Himantopus candidus, Bonnat, Table. Encycl. Ornith, p. 24, 1791.

The black-winged stilt passes through Manchuria as well as North China in flocks of from three or four to upwards of twenty individuals during the spring and autumn migrations. The species is then fairly common. I had several badly damaged specimens brought to me in April, 1916, which had been shot by local sportsmen in the Tientsin district; while I have frequently seen large flocks in that and other districts of North China. La Touche records it several times from the middle of April to the middle of May at Chin-wang Tao.

It is a very conspicuous bird with its black wings and back, glossed with green, its grey tail and pure white head, neck and lower parts. The legs are extremely long and of a pink colour; the bill is long, blackish, and has a very slight upward bend. The neck also is long, the total length of the bird being 14 inches.

It must not be mistaken for our next species, the avocet, which at a distance it somewhat resembles, but which is considerably less common in these parts.

332. Avocet.

Recurvirostra avocetta, L.

Recurvirostra avocetta, L., Syst. Nat. I, p. 256, 1766.

About the same size as the stilt, the avocet may at once be distinguished by its long black bill being upturned in a graceful curve. The long legs also are black, as well as the top of the head and back of the neck. The back and wings are black and white, the tail and all the under parts, including the throat and fore-neck are pure white.

I have secured this bird in Shansi, North China, and have seen it in the marshes round Tientsin during the migrations, whence, doubtless, it passes northward by way of Manchuria.

333. Ibis-billed Oystercatcher

Ibidorhynchus struthersi, Vigors.

Ibidorhynchus struthersi, Vigors, Proc. Zool. Soc. Lond., 1830, p. 174.

One of the most interesting birds that is to be met with in North China and neighbouring South-western Manchuria is the ibis-billed oystercatcher, or curlew, as it is called by some. Where ever there are boulder strewn valleys with permanent, clear, and open streams this bird takes up its abode, and may be found the year round.

Hitherto it has not, so far as I can ascertain, been recorded from Manchuria, but from the fact that it occurs in the mountain valleys behind Chin-wang Tao and Shan-hai Kuan, the latter place right on the Sino-Manchurian border, it may be assumed that it occurs further east in the same range well within the actual boundaries of Manchuria itself.

The bird belongs, however, to the North China and Central Asian avi-fauna, being a resident, as already indicated, in stony valleys of mountainous regions; nor does it ever occur far from the vicinity of mountains or hills.

La Touche found this bird breeding near Chin-wang Tao, and secured eggs.

The bird partakes of the characteristics of both the curlew and the oystercatcher, but appears to be more nearly allied to the latter. It is about the size of the oystercatcher, and, like it, has no first (or hind) toe. Its bill is long and curved like that of the curlew or ibis, whence it derives its name.

The middle of the crown, face, and throat are black, edged with white; while a broad black band encircles the chest, being divided from the grey of the lower neck or upper chest by a narrow band of white. The sides of the crown, cheeks, nape, neck, wings, tail and upper parts are ash-grey, the bases of the flight feathers being white, while the tail feathers are barred with darker grey, the outer web of the two outermost being barred black and white. The upper tail-covert is black, all the lower parts being pure white. The bill, eye-lids and fris are deep crimson; the legs a fine mauve. Length 16½ inches.

The bird is perfectly hidden amid its surroundings of rounded rock, boulders, and large stones in the valley-bottoms it frequents. It keeps entirely to the water, in the shallower parts of which it finds its food. The latter consists of small crustaceans and molluscs, as well as aquatic insects. I have frequently seen this bird swim where the water was too deep to wade.

Its flight is somewhat like that of the lapwing, being jerky and seemingly not very fast. When flying, but as far as I have been able to ascertain at no other time, it utters its loud plover-like call, which is plaintive and not unpleasant, and is continued incessantly till the bird alights once more, when it abruptly ceases.

In districts, where suitable surroundings occur, that is, throughout the whole of the mountainous and hilly regions of North China, as far south as the Ching Ling Mountains, it is very common. The Chinese name is *Sui-shih-chi*, which means "water chukar," *Shih chi* or "stone-hen" being the name for the chukar or red-legged partridge, and it must be admitted that the name is an apt one.

Family Arenariidæ (Turnstones.)

This family, which includes a number of plover-like birds, at the same time being related to the oyster-catchers, is represented in our list by but a single species, the common turnstone. Taking into

consideration the movements of other birds-of-passage, it is possible that the American Pacific coast turnstone (*Arenaria melanocephala*,) or black turnstone, as it is usually called, may occur in Eastern Siberia and the eastern parts of the Manchurian Region as a straggler; but so far as I know, there are no records of this.

334. Common turnstone.

Arenaria interpres interpres (L.)

Tringa interpres, L., Syst. Nat. I, p. 248, 1766.

I shot two turnstones on the bank of the Sungari River near its junction with the Amur on August 20th, and since the birds were still in their somewhat worn breeding plumage came to the conclusion that they might have been breeding locally.

Once, early in August, I saw a pair of these birds on the sea-shore at Pei-tai Ho, which, however, I failed to secure. Dresser reporting in the *Ibis* on the Russian Arctic Expedition of 1900-1903 says the Turnstone was found to be very common in Taimyr and New Siberia; while Captain Snow includes it in his list of birds inhabiting the Kuril Islands. It is also recorded by Giglioli and Salvadori from Olga Bay in September, and by Buturlin from the Ussuri, so that it appears to enjoy a wide distribution in these parts, as well as being fairly common.

About nine inches in length the turnstone has the head, neck, and breast brownish-black, flecked or spotted with white; the mantle, scapulars and wing-coverts brown-black, the feathers edged with chestnut; the fore-neck and sides of the chest are black, the flight feathers and tail being dusky-black; the chin, a band just above the bill, and another across the forehead, including the cheeks, the sides of the neck, breast, belly, under tail-covert, and a bar across the wing are white. The bill is less than an inch in length, and of a black colour; while the legs are yellow.

Of a stocky and strong build, the turnstone is swift in flight. It obtains its food by turning over stones in search of small crustaceans and other aquatic forms of life that inhabit the sea-shore or margins of rivers and lakes. It is this habit, of course, that has given the bird its name. It is a little smaller than the golden plover, and is of an excellent flavour, so that it is much sought after by shore-bird shooters.

Family Phalaropodidæ (Phalaropes.)

The phalaropes, of which two species occur in our region, are distinguishable from all other small waders, or shore-birds, by their peculiarly lobed toes. The latter resemble nothing so much as the lobed toes of the coot, and it is from this fact that the former of our two species, the grey phalarope derives its classical name, *Phalaropus fulicarius*. Another peculiarity about these birds, which, however, is shared by many other shore-birds, is the complete transformation in their plumage, brought about by the changing seasons. In the summer dress there is a predominance of reddy-brown or chestnut, while the winter dress is characterized by an almost complete change to grey. Yet another unusual character must be noticed here, namely, that the females when in the summer dress are more richly coloured than the males, the sexes being further differentiated by the males being the smaller. It is believed that the latter alone carry out the business of incubation

335. Grey Phalarope.

Phalaropus fulicarius (L.)

Tringa fulicarius, L., Syst. Nat., I, p. 249, 1766.

The grey phalarope, in its winter plumage, has the top of the head, face, eyebrows, throat, breast, lower parts, and a bar on the wing-coverts white, the eye being surrounded by a greyish-black patch, which takes in the cheek. The sides of the crown and back of the head are also of the same greyish-, or dusky-, black. The neck, back, scapulars, wing-coverts and sides of the chest are of a fine pearl-grey, the tail being somewhat darker, and the flight feathers dusky-black. In summer the plumage assumes a reddish chestnut colour, the face becoming black, the patch round the eye white, and the underparts, including the foreneck, a rich chestnut-red. The back and upper parts become greyish-brown, with chestnut edgings to the feathers. The bill, which was black in winter, now becomes yellowish. It is under an inch in length: the whole bird measuring some 8 inches.

Snow records this bird as occurring in the Kurils; while Clark mentions it, under the name of the red phalarope, as being seen at sea off the coast of Unalaska in the North Pacific in great numbers. Dresser records it as being one of the commonest birds seen by Dr. Birulia and other members of the Russian Arctic Expedition on the coasts of Northern Siberia.

336. Red-necked Phalarope.

Lobipes lobatus (L.)

Tringa hyperborea et *Tringa lobata*, L., Syst. Nat. I, p. 249, 1766.

This species has the head, nape, and mantle ash-grey in the winter plumage, the rest of the upper parts being dark grey mixed with chestnut-red. The neck is chestnut-red, the chest ashy-grey, and the under parts white, a conspicuous white band occurring on the wing. In the female the throat is white. During the breeding season the plumage of the upper parts assumes a browner colour, the lower parts remaining white. The bill in this species is more slender than in the grey phalarope, and of a black colour; while the legs and feet are greenish.

Clark records this bird as "common on the pools in the marshes on Bering Island." Giglioli and Salvadori record it from Olga Bay in September, and Stejneger gives it in his list of birds of the Kuril Islands.

Family Scolopacidæ. (Woodcock, Snipes, Sandpipers, Godwits, Curlews, etc.)

We now come to a large and important family of shore-birds and waders, the *Scolopacidæ*, which is represented in the Manchurian avi-fauna by some thirty-six species. In it are included the woodcock and snipes, which are amongst the most important game-birds, if the term be used in its widest sense, of the whole region. Not only are these birds represented by a large number of species, they are individually abundant; and as they are all edible, though varying in flavour and the quality of their flesh, it will be admitted that the family is one of great economic importance. They are all characterized by long bills, rather long necks, and long legs, though there is a good deal of variation in these characters amongst the different species; while their plumage is, for the most part, varying shades of brown, variously streaked or speckled with black, buff or chestnut, the under parts in most species being white, or light coloured. Some of the species show marked seasonal variation in their plumage, as with the phalaropes, and it is interesting to note in connection with these that the summer plumage is usually characterized by an increase or prevalence of chestnut.

337. Woodcock.

Scolopax rusticola, L.

Scolopax rusticola, L., Syst. Nat. I, p. 243, 1766.

Though belonging to a family, the members of which are nearly all pure birds-of-passage, at least as far as Manchuria is concerned, the woodcock, apparently, breeds in that country, and so should really be classed with the summer visitors. Wintering along the Yang-tzu Valley, and in South China generally, this well-known bird is not so great a traveller as some of its near relatives, the snipe.

In spring the woodcock appears in certain comparatively restricted areas in these eastern parts for a short time ere it passes on to its breeding haunts. One of its favourite stopping places *en route* is Chefoo on the northern coast of the Shantung Promontory, whence it apparently crosses to Dalny and Port Arthur on the Liao-tung Peninsula, and so on into the Manchurian and Amur forested areas. It is also commonly met with in certain parts of Corea, being particularly plentiful in the hills round the mouth of the Yalu River, whence, also, it has easy access to the Kirin and Ussuri forests. A few birds pass through the Tientsin district, doubtless having followed the Grand Canal from the Nanking and Wu-hu districts on the lower Yang-tzu, and bound for the Tung Ling and other wooded areas of North Chihli. La Touche records the woodcock twice at Chin-wang Tao, to the north-west of which place are hills, in which are certain more or less restricted wooded areas suitable for the bird's breeding requirements. I have also found the woodcock during spring, summer, and autumn in the mountains of West and North-west Shansi, where doubtless it breeds. In Manchuria I came across it in August and September in the forests round I-mien-po in North Kirin.

It is thus a bird of almost universal distribution within certain latitudes in Eastern Asia, though very local in any given area.

So well known a bird as the woodcock needs no description. The eastern birds are inseparable from the species that inhabits Europe and the British Isles.

338. Jack Snipe.

Limnocryptes gallinula (L.)

Scolopax gallinula, L., Syst. Nat. I, p. 245, 1766.

The little jack snipe is a comparatively rare bird in these parts. A very few have been reported by local sportsmen from time to time. Captain Snow gives it as occurring in the Kurils, and since it has been shot at, or near, Chin-wang Tao, it may fairly be considered as passing through Manchuria.

It may be recognized at once by its small size and comparatively short bill; while a closer inspection will reveal the beautiful green and purple gloss that characterizes the black of the back, and which is displayed by none of the other snipe. Otherwise its colour and markings are very much those of the common snipe.

The total length of this bird is 8 inches, the bill measuring 1½ inches, while its weight is about 2½ ounces, as compared with a length of 10½ inches, a bill of 2½ inches, and a weight of 4 to 4½ ounces in the common snipe of these parts, *Gallinago gallinago raddei*, a close relation of the more westerly *Gallinago g. cœlestis*.

339. Radde's Snipe.

Gallinago gallinago raddei (Buturlin).

Scolopax (*Gallinago*) *gallinago raddei*,, Buturlin, "Limicolæ of the Russian Empire," Pt. I, 1902, pp. 54, 56 & 58. (In Russian).

The common snipe of Eastern Asia has been described by Buturlin as a subspecies, distinct from the more westerly *Gallinago cœlestis* of Frenzel, or, as it has frequently been called, *G. gallinago* of Linnæus.

Buturlin described his form as having the light stripes on the upper parts wider than in true *gallinago*, and also that the under wing surface and axillaries are less conspicuously barred with dusky, the axillaries often being pure white. An examination of a series of specimens from the British Isles and the Far East, in the British Museum, shows that of these two characters the former is unreliable, though the latter, *i.e.* the less conspicuous barring of the under wing surface and axillaries, and frequent absence of any barring on the axillaries, being a perfectly constant difference, justifies Buturlin's separation of the two forms. Other

differences given by Buturlin are that the median pale stripe on the crown is wider in the eastern form, which also has the dark parts of the feathers of the mantle more freckled with rufous, and the chest less spotted with brown. It is very doubtful if these differences would hold good throughout a series of specimens. As a matter of fact there is a good deal of individual variation amongst the snipe referable to this subspecies. A March specimen in my possession that was taken in the Tientsin district has the back very black, with only very narrow cross-bands of chestnut and a few almost white longitudinal streaks. The neck and chest are mottled grey-buff. A May specimen from the same locality has a greater abundance of chestnut cross-bands, chestnut-buff longitudinal streaks, and distinctly chestnut-buff neck and chest. A September bird from the same locality is intermediate in regard to these characters, but differs from both of the others in having the tail feathers of a richer, deeper chestnut. The March bird has the bill $\frac{1}{4}$ inch longer than in either of the other two, in which this organ measures $2\frac{1}{2}$ inches.

Of universal distribution in East China, Corea, and the Manchurian Region, this bird occurs in enormous numbers in all marshy districts. It may be found throughout the Lower Yang-tzu Valley, and South and South-east China during the winter, on which account it is known to local sportsmen as the winter snipe. It makes its appearance in North China often as early as the second week in March, but does not become plentiful till the beginning of April. Though it may be secured throughout the spring, and even in early summer in these parts, it ceases to be really plentiful by the end of April, its place being taken by Swinhoe's and the pin-tail snipe. These birds winter not in South China or along the Yang-tzu, but somewhere far to the south, and appearing in the Shanghai area for the first time in spring have become popularly known on the China Coast as spring snipe.

The winter snipe, leaving North China, passes northward through Manchuria, where many stop to breed on the wide flat-lands of the great river valleys, such as those of the Amur and Sungari. I secured specimens of this species on the north bank of the Sungari near its junction with the Amur in July, and later in the first week in August saw large numbers all along the river's banks. The

bird has also been shot in July in the Pei-tai Ho district near the south-western border of Manchuria, where, apparently, it breeds in the low lying marshy areas.

Ingram records it as *G. cœlestis* from North Kirin as having been taken on May 21st, August 27th and September 3rd-17th.

Jouy's collection contains two specimens from Corea without data, which Clark referred to Hodgson's subspecies *G. gallinago uniclavus*.

340. Pin-tail Snipe.

Gallinago stenura (Kuhl).

Scolopax stenura, Kuhl, teste Bonaparte, Ann. Stor. Nat. Bologna, IV, fasc. 14, p. 335, 1830.

The pin-tail snipe may be recognized at once by its peculiar tail, which has twenty-six feathers, none of which are large, the outer sixteen being reduced to narrow, almost pin-like shafts. The bird is further characterized by a greater proportion of buff on its upper parts, giving them a lighter general colour. It measures under 10½ inches, but since its tail is so short, its actual size is greater than Radde's snipe, and about equal to our next species, Swinhoe's snipe. The bill is between 2½ and 2¾ inches in length. The under surface of the wing, flanks, and axillaries are closely barred zig-zag dusky-black on a white background; while the upper parts are less streaked and more barred or speckled than in Radde's snipe.

I came across this species in the West Kirin forests, where it was exceedingly abundant in May in the clearings, especially where the local settlers were cutting away the timber and turning fresh soil. I secured specimens also on the Yalu River in May. It is very common in the Tientsin district and at Newchwang in the late spring, when with Swinhoe's snipe it makes its appearance after Radde's snipe has gone north.

Jouy's collection contains specimens from Seoul and Chemulpo in Corea, taken in August and September. La Touche records it in May at Chin-wang Tao; while Ingram records it from North Kirin on May 23rd and August 18th, 20th and 23rd.

Prizewalski found it breeding in Southern Mongolia along the Huang Ho (Yellow River), probably in the swampy area north of the Ordos Desert. It breeds also within the Arctic circle from the Yenesei to the North Pacific; while it is known to winter in Burma and India, as well as in more southerly countries.

341. Swinhoe's Snipe.

Gallinago megala, Swinhoe.

Gallinago megala, Swinhoe, Ibis, 1861, p. 343.

This snipe, which is also classed by sportsmen in the East in the category of spring snipe, resembles the pin-tail snipe, from which it may be distinguished by its somewhat darker colouring, slightly longer bill, and the fact that the tail has twenty feathers, of which eight are large, two are medium and only ten are reduced in size, these ten, nevertheless being larger than the pin-like shafts of the pin-tail snipe.

It occurs fairly plentifully along the East China coast during the migrations, being late in its appearance as with the pin-tail. It measures some $10\frac{1}{2}$ inches in length, the bill being just over $2\frac{3}{4}$ inches.

I came across this bird in great numbers early in August upon the Sungari River near its junction with the Amur, where, also Radde's snipe was very common. I am inclined to think that it, too, breeds in this region.

La Touche records it in May at Chin-wing Tao; while I have taken specimens at the end of April, in May and in September in the vicinity of Tientsin.

342. Japanese Solitary Snipe.

Gallinago solitaria japonica, Swinhoe.

Gallinago japonica, Swinhoe, Ibis, 1873, pp. 363-364.

Spilura japonica Bonaparte (*nomen nudum*) Compt.-Rendue, XLIII, p. 579, 1856.

The first definite descriptive separation of this bird from true *solitaria* was that given by Seebohm in the "Ibis" (1886, pp. 129-130), where he says that Bonaparte's name *japonica*, being unaccompanied by any description is a *nomen nudum*; but since Swinhoe, using Bonaparte's name, described the bird, it becomes *Gallinago solitaria japonica* Swinhoe, and not *G. s. japonica* Bonaparte.

The solitary snipe occurs in the mountainous areas of North China the year round, where ever open water is to be found. It is, as a rule, more plentiful in certain areas in the winter, for at

that season it necessarily congregates where open water occurs, while at other times it scatters and becomes in truth solitary. The same may be said of it in the Manchurian Region, where Buturlin has recorded it in the Ussuri Valley.

That it is to a certain extent migratory is evidenced by the fact that it is sometimes shot in non-mountainous areas during the migratory season. But on the whole it keeps to mountain valleys. I have secured it in such places in Chihli, it being very common in winter in the Tung Ling, in Shansi and also in Shensi, where in the deep valleys of the Ching Ling range in the south I found it extremely plentiful as late as the beginning of May.

This bird is the largest of the Eastern snipe, and may be recognized by this fact, and also by the closely barred, almost vermiculated plumage of its upper parts, in which white, or grey-white takes the place of the buff in other species. The chest and neck are very much greyer or more dusky than in the other species, while the throat and spots on the head are white or grey-white instead of buff-white. Nearly the whole of the lower parts are closely barred with dusky bands. The bird is characterized by having twenty tail feathers, of which eight are as large as those of Radde's snipe, two are somewhat smaller, and ten are very much smaller and more narrow. The length is 12 inches, the bill measuring 3 inches; while the weight goes up to 10 ounzes in plump specimens.

Our form differs from true *solitaria* of Europe in having the lower breast barred, this being plain white in *solitaria*, the pale dorsal stripes very narrow, instead of very broad, and the primaries plain throughout, instead of marbled towards their tips.

343. Latham's Snipe.

Gallinago australis, (Latham.)

Scolopax australis, Latham, Ind. Orn. Suppl. p. 65, 1801.

Though a very rare visitor to China, this bird, which belongs more to Japan, seems to be more common in Manchuria, where it has been recorded by Poliakov from the Ussuri. Snow also records it from the Kuril Islands.

It breeds in Japan and winters in the Philippines and as far south as Australia.

It may be recognized by the fact that it has eighteen tail feathers, only the two outermost of which are reduced in size. It is a larger and stouter bird than the common snipe, has the upper parts more of a dark sandy isabelline than rufous; while the flanks are less banded.

344. Painted Snipe.

Rostratula capensis (L.)

Scolopax capensis, L. Syst. Nat. I, p. 256, 1766.

Though it is not a true snipe at all, I am dealing with this beautiful bird here, for the reason that both in the literature upon Eastern sport, and in the minds of all Eastern sportsmen, the so-called painted snipe is inseparably associated with the members of the genus *Gallinago*.

As a matter of fact the painted snipe, shows some affinities with the rails and should be considered as a connecting link between the *Scolopacidæ* and *Rallidæ*.

This beautiful bird has a range extending over the greater part of China and Japan, throughout the countries of Southern Asia and all over Africa. It occurs commonly in North-eastern China and Southern Manchuria from May till the end of September, and it undoubtedly breeds in these countries. How far north it extends I am unable to say.

About the size of the common snipe, the painted snipe has the legs and toes, especially the latter, a good deal longer, though the bill is shorter and bent down at the tip. The wings are large and more rounded than in the true snipes, while the feathers are considerably softer. But what constitutes the most peculiar characteristic is that the female is larger and in some ways more beautiful than the male.

The former has the crown a dark blackish-brown with a buff stripe in the middle from the base of the bill to the back of the head. The eye is encircled with white, the white extending backwards for a short distance, which gives the exact appearance of a pair of spectacles being worn by the bird. The chin is whitish, the cheeks and neck down to the chest a deep chestnut colour. A black band extends from the shoulders across the chest, next to which is a narrow white band, and then another black one, which, however, is broken below by the white of the lower breast and under

parts. The back and wing-coverts are of a dark grey, finely banded with black, and glossed with a rich olive green. A buff line extends down the middle of each scapular. The flight feathers are grey, barred with black, and with rows of large round buff dots on the web.

The male is much lighter, has the upper parts more spotted and barred with buff, and is without chestnut on the cheeks, neck, or chest, which are greyish-brown. The black bands on the chest and breast also are absent, while the eye-ring is buff instead of white. The upper parts, however, have a sort of golden appearance, which gives the bird its Chinese name of *Chin-chua*, of "golden snipe."

The painted snipe flies comparatively slowly, and with a more flitting, less direct motion than does the common snipe, and so is an easier mark to the sportsman, who, however, shoots it more as an interesting curiosity than as an addition to the bag.

It should be added that, though generally known under the generic name of *Rhynchea* (Cuv. 1817), *Rostratula* (Vicillot 1816) being the older name by one year is the correct one for this genus.

345. Broad-billed Stint.

Limicola platyrhyncha, (Temminck.)

Tringa platyryncha, Temm. Man. d'Orn. p. 398, 1815.

The broad-billed stint extends in its range from the British Isles to the Islands of Japan, breeding far to the north in Siberia, and wintering chiefly in the tropics. It is not a very common species, though it has been recorded from Olga Bay on the Primorsk coast by Giglioli and Salvadori, while I secured a specimen at Pei-tai Ho, on the northern shore of the Pei-chi-li Gulf on July 16th, where, apparently it was nesting on a flat, grassy meadow close to the sea.

This species presents something the appearance of a small snipe, especially on the upper parts, where the black feathers are edged with chestnut and buff. The chest and lower neck are brownish speckled with black and white. There are twelve tail feathers of a grey colour. The lower parts are white.

In winter the plumage is general ashy-grey above, paler on the edges of the feathers, which have dusky-brown centres. The lower back, rump and upper tail-covert are blackish, with but slight remains of the sandy-buff margins. The lower parts are white.

The bill, which is 1¼ inches in length first bends slightly upward and then slightly downward, and is rather depressed and broader than in most of the stints or sand pipers. Total length 6½ inches.

346. Pacific Dunlin.

Pelidna alpina sakhalina (Vieillot.)

Scolopax sakhalina, Vieillot, Nouv. Dict. Hist. Nat. ed. 2, Vol. III, p. 359, 1816.

Tringa alpina var. *Americana*, Cassin, Birds of North America, p. 719, 1858.

The Pacific dunlin, four specimens of which I secured at Pei-tai Ho one summer on July 14th, 16th and 18th, is another rather snipe-like bird. It may be recognized at once, however, by its black breast and belly. Though not abundant, this bird is more common than the foregoing species. Jouy's collection contains five specimens taken at Chemulpo, Seoul, and the Naktung River at Fusan in May and October respectively. La Touche records it under the name *Tringa americana* at Chin-wang Tao on May 3rd, 1913, when he saw a small flock of five. Captain Snow gives *Tringa cinclus* and Stejneger *Pelidna alpina pacifica* (Coues) as occurring in the Kuril Islands. Buturlin records it from the Ussuri region.

There can be little doubt that the specimens I secured at Pei-tai Ho had been breeding in the vicinity, as the possibilities of their being either belated stragglers from the south, or early returning birds that had accomplished their breeding in the far north, are remote.

In this bird the crown is black speckled thickly with chestnut; the nape, sides of the neck, lower fore-neck and chest grey streaked with black; the back and upper parts are speckled black, chestnut, and buff; the wing-coverts, quills, and tail are dusky; the chest and belly are black, the flanks, thighs, and under tail-covert are white.

In winter the plumage of the upper parts is more of a uniform greyish colour without the speckling, the under parts being white with grey on the breast.

The bill, which is black, and like that of the snipe, is 1½ inches in length; while the whole bird measures 8 inches. The legs and feet are black.

347. Knot.

Tringa canutus, L.

Tringa canutus, L. Syst. Nat. I, p. 251, 1766.

The knot is one of the commonest of the larger sandpipers to be met with throughout the marshes of North-eastern China and South Manchuria during the migrations. While waiting in the marshes round Tientsin for duck flights, I have frequently seen this bird, sometimes singly, but more often in little groups of five or six. I secured a single specimen on the grassy flats at Pei-tai Ho on July 17th, where, apparently it had been breeding. According to Dresser, reporting on the Russian Arctic Expedition, the knot breeds in Siberia in Western Taimyr and New Siberia Island, where it arrives towards the end of May. My specimen, which was paired, its mate eluding my efforts to secure it, was doubtless merely a casual breeder in this district. Dresser states that the nests were found on the tundras, placed usually on a slight elevation, and consisted of a hollow well lined with licken. These nests were found at the end of June and the beginning of July, and contained four eggs each. The incubation took three weeks to accomplish. This places the earliest possible date at which a parent bird, breeding in these northerly latitudes, could commence its southward journey somewhere in the beginning of August, so that all possibility of the birds I saw and secured on July 17th being early returners from the far north is excluded; and the only inference is that at which I have arrived at above.

The knot in summer has the crown and neck reddish-brown, with darker streaks; the upper parts are black spotted and barred with chestnut and white; speckled with white on the tail covert, the tail quills being grey, edged with white; the face, eyebrows cheeks, throat, breast, and belly are of a fine chestnut colour, the under tail-covert being white.

In winter the upper parts are ash-grey, the lower parts white. The length of the bird is 10 inches; the bill 1¼ inches. Both bill and legs are black.

Schrenck records this species from the Amur.

348. Eastern Knot.

Tringa crassirostris, T. and S.

Tringa crassirostris, Temm. et. Schl. Fauna Japonica, p. 107. pl. 64, 1847.

The Eastern knot differs from the foregoing in being larger, in having a longer, thicker bill, and in having white instead of chestnut lower parts in the summer plumage.

This is another bird that is common during the migrations in the marshes and along the sea-shores and rivers in the districts under discussion. I have met with it frequently in the marshes round Tientsin, and also secured a specimen at Pei-tai Ho on July 17th, where, as with other waders already mentioned, it was probably breeding.

Captain Snow gives it amongst the birds of the Kuril Island, where, doubtless it breeds more commonly. Giglioli and Salvadori record it from Olga Bay, and Schrenck from the Amur.

In the summer plumage the upper parts are grey, speckled with black and chestnut-buff on the lower back and wing-coverts. The lower parts are white, thickly speckled with black on the neck, more sparsely on the breast: the chin is rusty spotted with dusky, as also are the tail and flight feathers: the upper tail-covert is white barred with black.

The Winter plumage is grey above, white below without speckling.

The length of this bird is 11 inches; bill $2\frac{3}{8}$ inches. Legs and bill black.

349. Curlew Sandpiper.

Erolia subarquata (Güldenstadt.)

Scolopax subarquata, Güldenstadt, Nov. Comm. Petrop. XIX, p. 471, 1774-1778.

The curlew sandpiper or stint may be recognized at once by its down-curved bill and very speckled appearance when in its summer plumage. The head, neck, and back are black speckled with buff and chestnut, the upper tail-covert being white barred with black; the tail and wings are dusky grey; the throat is white flecked with chestnut; the under parts are white, barred with black and chestnut, each feather being white at its base, chestnut in the middle, and black along the apical margin.

In winter the plumage of the upper parts are greyish or ashy-brown, slightly mottled, the under parts being white, washed with ashy-brown on the breast. Length 7½ inches; the bill being 1½ inches, curved downward, and black in colour. The legs, which are rather long, are black.

This is another of the birds-of-passage that I found apparently breeding at Pei-tai Ho, and specimens of which I secured on July 18th. Schrenck records it from the Amur.

This bird is one of the greatest travellers even amongst the birds-of-passage, for its journeys extend from northern Siberia on the shores of the Arctic Ocean to Tasmania, Cape Colony, and Patagonia.

It is frequently referred to under Brünnich's later name of *ferruginea*,* but the above is, I think, the correct one.

350. Sharp-tailed Sandpiper.

Pisobia acuminata, (Horsfield.)

Totanus acuminatus, Horsfield, Trans. Linn. Soc. XIII, p. 192, 1821.

This bird may be recognized by its somewhat larger size than the foregoing, and by its long pointed tail. The summer plumage is black above, closely streaked with chestnut, buff, and a little white, or grey-white, on the edges of the feathers; while the lower parts are grey-white, flecked with chestnut on the chest, lower neck, and upper breast, and speckled all over with dusky; the quills are dusky, those of the tail being more ashy, margined with buff or white.

The winter plumage is lighter above and below. Total length 8½ inches; bill 1 inch, and black at the tip, yellowish at the base. Legs long and black. La Touche records a small flock at Chinwang Tao on May 22nd 1911.

351. Eastern Little Stint.

Pisobia ruficollis (Pallas).

Tringa ruficollis Pallas, Reis. Russ. Reichs, III, p. 700, 1776.

This, the little stint of the East, may be distinguished from other species common to these parts by its chestnut throat. The feathers of the head, nape, back, and scapulars are black edged

* Meyer, Ann. Wett. Ges. I, p. 53, 1809.

with chestnut and brown; the wing-coverts are dusky-grey; the quills and tail dusky; the chest, breast, and lower parts are white. In winter plumage the upper parts are brownish, with little or no chestnut and black. Length 5 inches: bill 11/16 of an inch.

I secured two specimens at Pei-tai Ho on July 16th, and, as in the case of other waders taken in this vicinity, I believe that it had been breeding there. Giglioli and Salvadori record it under the name of *Actodromas albescens* Temm. from Olga Bay on the South-east Manchurian coast. Stejneger gives it under the same generic name in his list of Kuril Island birds.

352. Long-toed Stint.

Pisobia damacensis (Horsfield).

Totanus damacensis, Horsfield, Trans. Linn. Soc. XIII, p. 192, 1821.

The long-toed stint is another of the small stints that pass through the Manchurian Region and North China to their true breeding grounds in the far north, though it is evident from the fact that I secured a specimen on July 14th at Pei-tai Ho that some at any rate stop off to breed where suitable ground occurs. Schrenck records it as *Tringa subminuta*. Clark records this little bird as "rather common in the large swamp at Bering Island," while Snow gives it under the name *Tringa subminuta*, Midd. amongst the birds of the Kuril Islands. It is very like the foregoing, but may be distinguished at once by the absence of the chestnut coloured neck, and also by its longer toes. The head, neck, and upper parts generally have a very speckled appearance, owing to the fact that the feathers are black with buff and chestnut edgings. The quills and tail feathers are dusky, edged with buff; the throat is white, the breast grey streaked with brown, and the rest of the lower parts are white. The winter plumage is greyer, less speckled above, and white below. Length 5½ inches; bill ¾ of an inch; the toes, as already stated, being longer than in other species.

353. Temminck's Stint.

Pisobia temminckii (Leisler.)

Tringa temminckii, Leisler, Nachtr. Zu Bechst. Nat. Deutsch., I, p. 55, 1811.

Temminck's stint is the smallest of the East Asian forms, and is distinguishable from the Eastern little stint (*P. ruficallis*) by the absence of any chestnut on the throat, and from the long-toed stint

(*P. damacensis*) by its shorter toes, while it is easily distinguishable from the sharp-tailed sandpiper or stint (*P. acuminata*) by its more dusky colour and much smaller size.

It has the head and back grey-brown, speckled with chestnut and black; the quills and tail feathers are dusky; the throat, lower breast, abdomen, under tail-covert and rump are white; the chest is greyish, speckled with dusky.

In the winter plumage the upper parts are greyish, without speckling, the lower parts white.

This bird is just under 5 inches in length, the bill being $\frac{3}{4}$ of an inch.

I secured specimens in the marshes round Tientsin in April. Ingram records what is probably this bird under the name of *Tringa minuta* from North-west Kirin on August 27th and September 9th, when specimens were taken. Schrenck records it and *Tringa minuta* from the Amur.

354. Spoon-billed Sandpiper

Eurynorhynchus pygmæus (L.)

Platalea pygmæa, L., Mus. Ad. Frid., II, Prodr., p. 26, 1764.

The little spoon-billed sandpiper may be recognized by its peculiar bill, which as the name suggests, is shaped like a fattened spoon or spatula, very much like that of the spoon-bill. It has the upper parts black with rufous margins to the feathers, the forehead, eyebrows, cheeks, throat and foreneck chestnut spotted with black; under parts white. In winter it has the upper parts dusky-or greyish-brown, the under parts white. Length 6 inches.

The bird is not at all a common species, being supposed to breed somewhere to the North of the Bering Straits, to reach which it probably passes through the Manchurian Region on its way from its winter quarters.

355. Sanderling.

Calidris arenaria (L.)

Tringa arenaria, L., Syst. Nat., I, p. 251 & 255, 1766.

La Touche records the sanderling at Chin-wang Tao, where he saw a flock of six or seven on May 18th, 1913. Captain Snow also records it from the Kuril Islands. Dresser reports it, on the observations of the members of the Russian Arctic Expedition, as breed-

ing in Western Taimyr in Siberia, the first arrivals appearing at the end of May, incubation taking place during July, and the return southward beginning about the middle of August. I secured a pair of these birds at Pei-tai Ho on July 17th, from the same flats as the other species mentioned, and it must be presumed that they were breeding there.

In summer the feathers of the upper parts have rather broad, black centres, and are edged with chestnut, the tips being grey. The flight feathers are dusky or black, with white bases, the middle tail feathers also being dusky, the edges of the outer ones white. The face, throat, sides of neck and chest are of a pale chestnut red, spotted lightly but rather closely with small dusky dots. The rest of the lower parts are white.

The winter plumage has the upper parts sandy-grey, with lighter margins to the feathers, and narrow, dark centres, the face, cheeks, throat, and lower parts being pure white.

The total length of this bird is 7 inches; the bill is 1 inch or a little shorter, and like the legs is black in colour.

356. Greenshank.

Glottis nebularius, (Gunnerus.)

Scolopax nebularius, Gunnerus, Leem. Lapp. Beschr., p. 251, 1767.

The greenshank may be recognized by the unusual length of its legs, which are of a dull olive-green. It is a fairly common bird in the marshy districts of North China and Manchuria during the migrations, and, with the red-shank, is often offered for sale in the local game markets as a substitute for snipe.

It has the crown, nape, and upper parts generally of a greyish white, streaked with dusky, the dark increasing almost into bands on the back and wing-coverts. The throat, fore-neck, under parts, rump, and tail are white, the under parts streaked with light dusky, the tail barred with black. In winter, as is usual with these waders, the upper parts become greyer and the lower parts pure white.

With its long bill and neck the bird measures 14 inches in length, but the body is not much larger than that of the snipe. The bill measures 2½ inches, is black at the tip, yellowish at the base, while the legs are, as already stated, olive green.

Under the name *Totanus nebularius glottoides*, Vigors, this bird has been recorded by Clark as having been collected by Jouy, a pair having been taken in September at Chemulpo; while Captain Snow mentions it under the name of *T. glottis*, L., as occurring in the Kuril Islands. I have frequently observed it in the vicinity of Tientsin, and on the great plains of the interior of North China, where marshes occur; as well as in the local game markets.

357. Armstrong's Greenshank.

Pseudototanus guttifer (Nordmann).

Totanus guttifer, Nordmann in Erman's Reis. um die Erde, p. 17, 1835.

This species, which is very rare in these parts, has, nevertheless, been taken in Eastern China, and so probably passes through the Manchurian Region, on which account it is included in our list.

It has the upper parts of a general ashy-grey, the feathers having black shaft-streaks and white edges: the lower back, rump, and upper tail-covert are white, the central tail feathers light ash-grey, the others white. The lower parts are pure white.

The total length is 12 inches. The basal half of the bill is horn yellow, the distal half blackish: the legs are ochraceous-yellow. The lower mandible of the bill has a slight tendency to bend upward.

La Touche was the first to secure this bird in China, having obtained one in the early eighties at Fuchow, while Styan secured it in Hainan in 1888.

358. Terek Sandpiper.

Terekia cinera, (Güldenstädt).

Scolopax cinerea, Guldenstädt, Nov. Comm. Petrop. XIX, p. 473, pl. 19, 1774.

Recorded by La Touche a few times at Chin-wang Tao in 1913, and secured by myself at Pei-tai Ho on July 15th, this sandpiper is, nevertheless a rather uncommon bird. Judging from the date on which I secured my specimen, and the appearance of its plumage, it was probably breeding in the vicinity. Giglioli and Salvadori record the species from Olga Bay on the South-east Manchurian, or Primorsk, coast.

The bird may at once be recognized by its bill, which turns upward like that of the avocet. The plumage of the upper parts, including the tail, is grey, lightly streaked with thin black lines. The secondary wing-coverts are blackish with an olive-green sheen. The throat and lower parts are white, with fine grey streaks on the former. The winter plumage has the upper parts paler, without streaks, and the lower parts pure white.

The legs are rather short, and of a blackish colour; the bill is 2⅛ inches in length; the total length of the bird is 9 inches.

359. Common Sandpiper.

Actitis hypoleucus, (L.)

Tringa hypoleucus, L., Syst. Nat., I, p. 250, 1766.

The common sandpiper has the upper parts of a fine greyish brown with an olive sheen, and finely barred with irregular dusky or dark-brown markings. The outer tail feathers are white, faintly barred with brown, the others are the same as the back. The throat, cheeks, and chest are of a lighter colour streaked with grey-brown, the breast and lower parts being white.

In winter the throat, sides of the neck, and chest are even lighter and more greyish, while the markings on the upper parts almost disappear.

The bird measures 7 inches in length, the bill is from 1⅛ to 1¼ inches, and like the legs is of a blackish colour.

This species is known to breed commonly in East China and Manchuria from Fokien province at least to the Amur region. Ingram's collectors secured specimens in July, August and September on the North Kirin plain; while I secured specimens on August 11th on the north bank of the Sungari River near its junction with the Amur. Schrenck also records it from the Amur. I collected a specimen in August in Tientsin. Captain Snow gives it in his list of Kuril birds; while Jouy's collection contains two specimens from Tsushima and Fusan. Giglioli and Salvadori record it from Olga Bay.

The species thus enjoys a very wide distribution in North China and the Manchurian Region, its range extending westward at least into Shensi, where I secured specimens in April in the Tai-pei Shan region.

360. Eastern Grey Sandpiper.

Heteractitis brevipes (Vieillot.)

Totanus brevipes, Vieillot, Nouv. Dict. Hist. Nat., VI, p, 410, 1816.

Louis Jouy's collection of Corean birds contains a pair belonging to this species from Tsushima and also a female from Fusan, all taken in May. Buturlin records it from the Ussuri, and Giglioli and Salvadori from Olga Bay and Port Lazareff on the Primorsk coast, and also from Corea.

According to Stejneger this species is the form that occupies Eastern Asia and not *H. incanus*. The same authority gives it in his list of birds of the Kuril Islands.

It is a smaller bird than *incanus*. It has the back and upper parts ashy-grey, the lower parts white, spotted and lined with dusky, the lower breast, sides of body, flanks and under tail-covert barred with dusky. In winter these lower parts are white without markings.

Length 9½ inches; bill 1½ inch.

361. Green Sandpiper.

Helodromus ochropus (L.)

Tringa ochropus, L., Syst. Nat. I, p. 250, 1766.

In this species the upper parts are greyish-brown, washed with an olive-green sheen, and spotted with white. The rump, tail, and lower parts are white. The breast and throat grey spotted with dusky or brown, the middle tail feathers being barred with dusky-brown towards the tops. In winter the white spots on the back become smaller, the plumage generally greyer, the throat white, the bars on the tail feathers fewer.

The length of this bird is 9¼ inches, the bill being 1¼ inches, and of a black colour. The legs are of an olive colour.

Though not as common as the common sandpiper, this species is, nevertheless, fairly plentiful throughout North, Central and East China and Manchuria.

Ingram records it from Northern Kirin on August 19th and in September; while I have secured specimens in August in the Tientsin district. La Touche records it from Chin-wang Tao,

stating that two seen a little inland from that port on May 28th, were apparenly mated. Jouy secured it at Seoul in Corea, and Poljakov records it from the Ussuri region. Stejneger gives *Totanus ochropus* in his list of Kuril Islands birds.

362. Wood Sandpiper.

Rhyacophilus glareola, (L.)

Tringa glareola, L., Syst. Nat., I, p. 250, 1766.

The wood sandpiper may be distinguished from the green sandpiper by its smaller size and the absence of the green sheen on the feathers of the upper parts, and from the common sandpiper by its white rump and tail.

It has the upper parts dusky almost black, and closely spotted or speckled with white, more so than in the green sandpiper. The rump, tail, and under parts are white, the tail being barred with dusky-brown the entire length of the feathers, the two outer ones only on their outer web. The throat and chest are greyish-white speckled with dusky. The winter plumage shows less white on the back and more on the under parts.

Length 7¼ inches; bill 1¼ inch, black.

I secured a pair of these birds in August in the vicinity of Tientsin, and Ingram records it from the Khingan Mountains late in May. La Touche records it at Chin-wang Tao early in May, and Snow includes it in the birds of the Kuril Islands. It is also in Schrenck's list of Amur birds.

363. Redshank.

Totanus calidris (L.)

Scolopax calidris, L., Syst., Nat., I, p. 245, 1766.

The redshanks may be recognized whether in flight or on the ground by their brilliant orange, or orange-red legs, which, being long, are unusually conspicuous. They also usually make a great noise when getting up, much after the manner of some of the plovers, thereby startling any other water-fowl that may be in the immediate vicinity.

The common redshank in summer has the top of the head, nape, back and wing-coverts brown closely speckled with a darker shade. The primaries are dusky-black, the secondaries are white,

the rump and tail also being white, with a few bars of dusky-black on the latter. The underparts, including the throat and neck are white or whitish, with a few streaks of brown on the neck and breast. There are distinct white or whitish eyebrows.

The winter plumage has the upper parts much lighter, more ashy; while the lower parts are pure white, with a few light streaks on the neck and breast.

The legs are long and of an orange colour, the bill black at the tip, dull brownish-yellow on the upper mandible, and bright orange on the basal portion of the lower mandible. The length of the bill is $2\frac{3}{4}$ inches, that of the whole bird 11 inches.

I have shot this bird in the Tientsin districts, and have seen it for sale in the local game markets. La Touche records it at Chin-wang Tao, and Giglioli and Salvadori at Olga Bay.

364. Dusky Redshank.

Totanus fuscus (L.)

Scolopax fusca, L., Syst. Nat., I, p. 243, 1766.

The dusky redshank is like the foregoing but has the plumage of the upper parts much darker, while the legs and basal portion of the lower mandible are a deeper, more reddy colour. The bird is also somewhat larger than the common redshank. It is more commonly met with in these parts, and, with the greenshank and the foregoing species, is sold in the local game markets.

La Touche records it at Chin-wang Tao, Poljakov from the Ussuri, and Giglioli and Salvadori from Olga Bay.

365. Marsh Sandpiper.

Totanus stagnatilis, Bechstein,

Totanus stagnatilis, Bechstein, Orn. Taschemb. II, p. 292, 1803, and Nat. Deutsch., IV, p. 261, 1809.

In this species of sandpiper the upper parts are light ashy-grey with a reddish tinge, the lower back and rump being white, and the secondaries only slightly marked. The feathers of the head, neck and upper back are centred and barred black, the throat and breast are whitish spotted with dusky, the flanks white barred with dusky; the rest of the lower parts are white. In winter the upper parts are ashy brown, some of the feathers being margined with white, the lower parts pure white with a few dusky streaks and bars on the breast and sides.

According to David this bird breeds in Eastern Siberia, but it is very seldom seen in China or Manchuria.

366. Eastern Bar-tailed Godwit.

Limosa lapponica baueri, Naumann.

Limosa baueri, Naumann, Deutschl. Vog. VII, p. 429, 1836. (ex. Natterer M.S.S., no description).

Limosa novæ zealandiæ, Gray, Gen. B. III, p. 570, 1847.

The godwits may be distinguished from other members of the family by their large size, long, straight bills, and long legs, but above all by the fact that the nail of the third toe is curved upward and serrated.

The bar-tailed godwit has the plumage in summer of a buff-brown, beautifully marbled on the back, streaked on the head, spotted on the neck, and barred on the breast and flanks with dark brown or black. It differs from the other godwits in having the upper tail-covert and tail barred with dark brown or black, and in having the rump and under wing coverts white, faintly barred with dusky-brown instead of chestnut as in the American species.

The winter plumage has the upper parts dusky-grey with little or no marbling, the under parts greyish white. It measures about 16 inches; the bill being brownish, the legs grey.

It breeds in Siberia replacing to the east of the Yenesei the European form *L. lapponica lapponica*, L., from which it differs in having the feathers of the lower back and rump blackish edged with white. It winters in Australia and New Zealand.

Jouy's collection contains several specimens taken in September, October and November at Chemulpo and Fusan in Corea, while Giglioli and Salvadori record it from Olga Bay. Captain Snow mentions *L. lapponica* as occurring in the Kuril Islands, and Schrenck gives *L. cinerea*, Gould, from the Amur. I secured specimens of this bird in the Tientsin district where it is fairly common during the spring and autumn migrations.

367. Black-tailed Godwit.

Limosa limosa melanuroides, Gould.

Limosa melanuroides, Gould, Proc. Zool. Soc., p. 84, 1846, and Birds of Australia, VI, pl. 28, 1848.

The black-tailed godwit differs from the foregoing in having the tail feathers black with white bases instead of barred. In

summer the upper parts are brown marbled or speckled with black, the chest and lower parts being chestnut barred with black; the under wing-coverts and axillaries white.

The winter plumage has the upper parts grey, the under parts light grey; while in both plumages the flight feathers are black. The bill is brownish, the legs grey. Length about 16 inches.

It differs from true *limosa* in being smaller.

I secured specimens of this bird in the marshes near Tientsin in March and April. Giglioli and Salvadori record *Limosa brevipes*, G. R. Gray, from Olga Bay, and state that the bird differs from the European *L. melanura* in its smaller size, which suggests that the bird they refer to is our present species.

368. Snipe-billed Godwit.

Linnodromus tackzanowskia (Verreaux.)

Micropalama tackzanowskia, Verreaux, Rev. et Mag. Zool. 1860, p. 206, pl. 14.

This bird, which was confused by David and Oustalet with the American willet (*Catoptrophorus semipalmatus*), breeds in Siberia and winters amongst other places in South China. It is not of very common occurrence, however.

It is one of the smaller forms of godwit, and is characterized by having the bill expanded and soft at the tip as in the snipe.

The summer plumage is grey on the upper parts, streaked on the head, and closely barred on the back and wings with blackish-brown; the wing-coverts are grey, the flight feathers black at their ends and white at their bases. The under parts are buffy-white, speckled on the neck with dusky, and barred on the flanks with dusky and chestnut; the abdomen and under tailcovert are white.

In the winter plumage the markings are absent, the upper parts being grey, and the under parts greyish-white. Length 12½ inches.

369. Oriental Curlew.

Numenius arquatus lineatus, Cuvier.

Numenius lineatus, Cuvier, Règne Animal., 2nd ed., I, p. 521, note 2, 1829.

There are some four distinct species of curlew that occur in our region, three of which belong to the genus *Nemenius*, the fourth, the smallest, being placed in a separate genus *Mesoscolopax*.

The Oriental curlew, which is only a subspecies of the common European curlew, has the plumage of the upper parts light buffy-brown, streaked all over with black. The throat, belly and thighs are light buff, without any markings. The rump and tail-coverts are white; the tail light brown-buff barred with brown. The primaries are black or dusky-brown. The winter plumage is lighter, but the markings remain. The bill is very long, curved and of a brownish colour lighter at the base of the lower mandible. The long legs are of a pale greenish colour. Length about 24 inches.

This bird is extremely common in North China and Manchuria, and details of records are hardly necessary. It has been recorded from Chin-wang Tao, Corea, the Khingan Mountains region and the Kuril Islands. Its breeding grounds are in Siberia.

370. Australian Curlew.

Numenius cyanopus, Vieillot.

Numenius cyanopus, Vieillot, Nov. Dict. Hist. Nat. VIII, p. 306, 1817.

This curlew, which closely resembles the foregoing, may be distinguished from it by the darker lower back and rump, and regular barring of the axillaries and under wing coverts, and also in being of a generally more fulvous colour. It is the same size as *lineatus*, *i.e.* 24 inches in length. It has a more easterly breeding range, breeding in Eastern Siberia and wintering in Australia.

In Jouy's collection there are two specimens from Chemulpo, taken in September; while La Touche records the bird as quite common at Chin-wang Tao. Bianchi records it from Ying-kou (Newchwang) where a specimen was taken on April 9th, 1901, by Captain Karpow. Buturlin also records it from the Ussuri, Giglioli and Salvadori from Vladivostok and Corea, and Stejneger from the Kuril Islands. Schrenck records *N. australis*, Gould, from the Amur region, probably meaning this bird.

371. Eastern Whimbrel.

Numenius variegatus, (Scopoli.)

Tantalus variegatus, Scopoli, Del. Flor. et Faun. Insubr. II, p. 92, 1786.

Considerably smaller than the curlew, the whimbrel may easily be recognized on this account, as well as by its rather straighter and proportionately shorter bill.

The plumage of the upper parts are of a buff-brown, slightly darker than in the curlew, and mottled or streaked with black or dark brown. The head is darker with a light stripe down the middle of the crown. The under parts are not so heavily marked as the upper parts, the ground colour also being a little lighter. Length 15 inches.

This species differs from the European *Numenius phæopus*, of which it is considered only a subspecies by some authorities, in having the lower back and rump more thickly barred and spotted with brown, and the axillaries more broadly and numerously barred.

It is of very common occurrence in these parts, being particularly plentiful in the marshes round Tientsin where it is shot by the natives and offered for sale in the local game markets. Captain Snow lists it with his birds from the Kuril Islands, La Touche records it from Chin-wang Tao, Buturlin from the Ussuri, and Taczanowski from Corea.

372. Little Curlew.

Mesoscolopax minutus, (Gould).

Numenius minutus, Gould, Proc. Zool. Soc. Lond., 1840, p. 176.

In this bird, which is the smallest of the four curlews of these parts, the plumage closely resembles that of the whimbrel, being if anything, a little more closely streaked and barred with dark brown or black. The head is dark with a distinct superciliary streak of pale buff. The bill is even shorter than in the whimbrel, and less curved. The bird measures about 13 inches in length.

It is recorded by La Touche as occurring a few times at Chin-wang Tao in 1913 from April 14th to May 3rd.

CHAPTER IX.

The Wild-fowl of Manchuria.

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The Wild-fowl of Manchuria.

The wild fowl of Manchuria, with the exception of a few forms, such as some of the eiders, which are only winter visitors, consist of the same species as inhabit or occur in Eastern China.

While the Lower Yang-tzu basin and the various rivers and lakes of the country bordering the sea from South Shantung to the Philippines form ideal winter resorts for the numerous species, the Manchurian Region affords many of them suitable breeding grounds, and even such species as prefer more northerly climes find there good and abundant feeding grounds as they pass *en route* through that country, or at least along its maritime borders.

Thus we find such places as the mouths of the Liao and Yalu Rivers literally swarming with myriads of wild-fowl of every description in both spring and autumn, but especially spring, and it is not surprizing that the districts round such places as Newchwang and Antung have become famed along the whole China Coast as veritable paradises for the wild-fowler.

Phenomenal flights of teal, wild ducks, and geese are often reported, when the sky from horizon to horizon is black with these birds, while swans of several species may be seen in large numbers.

The extensive tide-swept mud-flats that occur at the mouths of the Liao Ho and Yalu River offer splendid feeding grounds for these birds, and when these are covered at high tide, there are not wanting inland lagoons, which, with their rich beds of succulent water-weeds, are no less attractive to these denizens of the marshes. It is while passing to and fro between the mud-flats and the tidal lagoons that the ducks and teal afford the sportsman such splendid shooting. The Chinese, too, are not slow to take advantage of the bountiful harvest thus provided by nature, and, with their long-barrelled punt-guns, steal upon the birds when they are resting in the middles of the lagoons in their thousands, doing great execution, and selling the extensive bags thus made very profitably at the local game markets.

Not only are these river mouths of the South Manchurian Coast favoured resorts of the wild-fowl, but the whole of the Primorsk Coast, as well as the mouth and estuary of the Amur, supply just the required spots to tempt the birds to make a short stop-over, and some even decide to remain and breed in these attractive areas.

Many species follow the valleys of the great rivers and so arrive at interior lakes and marshes, where suitable feeding and breeding grounds occur. Teal of various species, such as the gargany, Baikal or spectached teal, falcated teal, and the common teal, as well as many species of duck, notably the yellow nib, shoveller, and mallard, may be found breeding in the marshes that lie in the great river valleys of Central and Northern Manchuria, where in autumn the young birds may be seen in great flock, soon to be joined by the even larger ones from further north.

The migrations of the wild-fowl call for closer attention, perhaps, than do those of other birds-of-passage, because these birds are of greater economic importance, and, to the sportsman, at least, are of far greater interest. And it may be that on this account they are better known to us.

Without going beyond the confines of what for our purposes, may still be called the Chinese Empire, we may discover immense areas which form the winter resorts of the wild-fowl of Eastern Asia. Commencing at about the 34th parallel of latitude and working southward we find every river valley is the winter home of large numbers of geese, ducks, teal and even swans. The valleys of Honan and South Shansi, and the famous Wei Valley in Shensi are splendid examples. In the latter such forms as the bean goose, mallard, ruddy sheld-duck, common teal, and yellow nib, or Swinhoe's duck, as it is often called, may be counted in tens of thousands. The geese swarm upon the fields of winter wheat, which provides them with ample food, while the duck and teal thrive in the rice-fields and marshes that are so prevalent.

On the Lower Yangtze, where, in such districts as Wuhu, and north of Ning-kuo Fu, lakes like the Tai Hai form ideal resorts for wild-fowl, we find the spectacled teal, gargany, scaup, tufted duck, white-fronted goose, bean goose, Middendorff's goose, and the thick-billed goose even more abundant than the birds of the Wei Valley. In the Hangchow area the falcated teal winters in great numbers.

When the time for migrating comes these various forms betake themselves northward, and it is noticeable that some of them follow special and definite routes; and it is in the determining of these special routes that the sportsman, by keeping note of the species he shoots in any given area, may help the naturalist. To take one example:

The white-fronted goose is particularly plentiful in winter in the Tai Hai Lake and surrounding marshes. Now this bird is seldom if ever seen on migration in Chihli (excepting the extreme north-east), Shansi, or Shensi, but it is well known in South Manchuria, especially at the mouth of the Yalu, and has been reported as plentiful along the Kuril Islands. It breeds along the north coast of Siberia. It has also been recorded at Chin-wang Tao, from Corea, and at Olga Bay on the Primorsk Coast. Thus we may conclude that this species, wintering in the Lower Yang-tzu basin, travels, possibly, up the China Coast as far as Shantung whence it crosses to Corea and the South Manchurian Coast, thence finding its way northward via the Primorsk Coast, the Kuril Islands, and Kamschatka to Eastern Siberia, then swinging westward spreads itself along the whole of the north coast of Siberia where it breeds.

Undoubtedly some species of wild-fowl actually cross the Gobi Desert to reach Siberia, while there are many that actually breed in the numerous lagoons that are to be met with along the southern borders and even within more or less arid Mongolia itself. Amongst these may be numbered the Eastern grey goose (*Anser rubrirostris*) and the two forms of sheld-duck, as well as some of the bean geese; but it may be taken that by far the greater number of wild-fowl, no matter where they winter in Central and South China, take a diagonal course, and pass through Manchuria in order to avoid the Gobi and arid steppes of Eastern Mongolia.

Others there are, such as the brant geese, that keep to the extreme eastern fringe of the continent, and in winter barely reach the China Coast; while the eiders and scoters only follow the sea-coast, keeping entirely to the sea.

There is one bird, which, more than any other member of the *Anatidæ*, may be said to belong to Manchuria, and that is the little mandarin teal (*Æx galericulata*), whose beautiful winter plumage makes it by far the most handsome of the whole duck family. It is closely related to the American wood duck

(*Æx sponsa*). The forests of Manchuria constitute the true breeding grounds of the mandarin teal, and it is here alone that the species can find suitable environments. With habits similar to those of the wood duck, this bird places its nest in the hollows of trees, and the young are reared in the safety and seclusion of the lonely streams and rivers that traverse the forest lands.

Family ANATIDÆ (Ducks, Geese, and Swans).

So well known a family as the *Anatidæ* needs no description as to its general characteristics. With their large, flattened bills, long, slender necks, short legs, and webbed feet, these birds are unmistakable, and the fact that they constitute a very important addition to our food supply has made them familiar to all.

There are some forty five species of ducks, teal, geese and swans to be included in our list of Manchurian birds, of which thirty two are ducks or teal, including the mergensers and shelducks, ten are geese, and the remaining three are swans.

373. GOOSANDER.

Mergus merganser, L.

Mergus merganser, L., Syst., Nat., I, p. 208, 1766.

The first of the wild-fowl to be dealt with are what are commonly called the fish-ducks. These may be recognized at once by their long, narrow, serrated, and hooked bills, which suggest some other diet than that sought for by the rest of the family.

These birds are not as a rule considered fair game by sportsmen, and so are seldom shot, with the result that there are fewer records of their occurence in these parts than of other species of duck. But this is not the only reason: they are actually very much fewer in numbers than most of the ordinary ducks, and are never seen in such immense flocks. They occur usually singly or in small parties of from three to five, and keep more to open water, where they find their food by diving. They are, however, of universal distribution, and with the exception of Gould's merganser (*Mergus squamatus*) of common occurrence.

The largest of the group is our present species, the goosander, which may be recognized by its large size, dark, glossy green head and upper neck, white or cream lower neck, chest and breast, the latter usually tinged with a beautiful salmon pink, black back and

inner scapulars, and grey lower back, rump, and tail. The bill is a rich crimson, the legs and feet orange. The bird measures up to 28 inches.

The female is smaller than the male, and is grey, with a chestnut head and cream coloured lower parts, the wing being barred white.

The goosander apparently breeds in the Kuril Islands, Kamschatka and Siberia. Clark records it near Milne Bay, Simushir, while Snow gives it under the name *M. castor* as inhabiting the Kurils. Schrenck records it from the Amur.

The nest is laid in holes in trees.

374. Red-breasted Merganser.

Mergus serrator, L.

Mergus serrator, L. Syst. Nat., I, p. 208, 1766.

This species is smaller than the goosander, and may further be distinguished by the presence of a pronounced crest. It has the head, crest, and upper neck of a dark, glossy green, a broad white collar dividing the green of the upper neck from the black-speckled chestnut-brown of the chest and upper breast. The lower breast is white or creamy-white, the flanks being vermiculated with fine grey lines. A band of white feathers edged with black occurs on each shoulder; the back and inner scapulars are black, the latter being falcate; the outer scapulars are white edged with black. The speculum is white barred with black. The rump and tail-coverts are white vermiculated with grey; the tail feathers grey and the flight feathers greyish-black. The bill is red, the legs and feet are orange-red. The male measures 24 inches, the fermale being smaller, with grey upper parts, white lower parts, chestnut-brown head and nape and white throat and fore-neck.

The red-breasted merganser is a little more common than the goosander. It breeds from Western Europe right across Siberia and in North America. The nest is made in a hollow sheltered beneath a tree or rock.

It has been recorded by Schrenck from the Amur, and by Buturlin from the Ussuri.

375. Gould's Merganser.

Mergus squamatus, Gould.

Mergus squamatus, Gould, Proc. Zool, Soc. London, 1864, p. 184., Ogilvie-Grant, Ibis, 1900, p. 602, pl. XII.

Mr. Ogilvie-Grant in his paper in the *Ibis on* birds collected by Captain A. W. S. Wingate in South China says of this species that it resembles *M. castor* (= *M. merganser*) in having the head and neck black glossed with green, the chest and rest of the under parts white, washed with pale salmon-buff. It resembles *M. serrator* in having two long crests, one situated on the occipital and the other on the nuchal region. It differs from both in having the black of the neck continued down the back of the neck to the interscapular region, while the lower back and rump, as well as the longer feathers of the sides, flanks, and under tail-covert, are white, with one or two narrow concentric black bands on them, producing an elegant scaled appearance.

In addition to this description it may be stated that the scapulars are black, the tail grey, the wing-coverts and quills white edged with black. The bill is red with a black patch in the middle, and a yellow nib; the legs and feet are orange-yellow.

The female has a washing of pale ash colour over the back and flanks, the top of the head being rich brown, the throat white. The length of the male is 24 inches, the female being somewhat smaller.

This is a rare bird, whose range is not definitely known, but since it frequents South-east China and the Lower Yang-tzu during the winter months and its breeding haunts are probably somewhere in Siberia, it probably passes through the Manchurian Region during migration, and so falls within our list.

376. Smew.

Mergellus albellus, (L.)

Mergus albellus, L. Syst. Nat. I, p. 209, 1766.

The smew is the smallest of the so-called fish ducks. It may be recognized except during the nesting and incubating season by its fine white plumage. In the adult male the crown, crest, cheeks, throat, neck, chest, breast, and scapulars are white. There is a black patch with a green sheen to it extending from the base of the bill up to and below the eye. The back of the neck is black,

which colour extends on to the back and as far as the tail. The flight feathers are dusky, and there is a glossy green band or speculum on the wing. The flanks, belly, and under tail-covert are lightly vermiculated with grey. Two narrow black bands extend from the back over the shoulders on to the sides of the chest. The bill is shorter than in any of the other species of merganser, and is of a greyish colour: the legs and feet are pinky-grey. The bird measures 17 inches.

The female is smaller, and has the head dark chestnut, the throat, fore-neck, and breast white; chest, flanks and tail grey; back and wings black with a white patch on the coverts, and white tips to the secondaries. Bill brownish; legs and feet bluish-grey.

The smew breeds from the west of Arctic Europe eastward throughout Northern Siberia to the Pacific. It makes its nest in hollow trees. It is very common throughout China and Manchuria. I have come across it in Kansu, Shensi, Shansi, Chihli, on the Yang-tzu and along the Yalu which divides South Manchuria and Corea. Schrenck records it from the Amur, and Bnturlin from the Ussuri.

377. Steller's Eider.

Polysticta stelleri (Pallas.)

Anas stelleri, Pallas, Spicilegia Zoologica, pt. VI, p. 36, pl. V. 1780.

The eiders are only winter visitors to the mouth of the Amur and down the coasts of the Primorsk as far as Corea. As a group these birds of the Arctic may be recognized by their light upper plumage, and usually dark or black lower plumage, and the pale emerald green on their heads. They are large ducks, the males always having the scapulars long and falcate, or sickle-shaped, while the females are all of a dull brown colour barred or speckled with dusky-brown or black. Their bills are short and feathered almost to the nostrils, which are unusually close to the tip.

The nests of these birds are always laid on the ground, being formed of seaweed and filled with masses of down, plucked by the parent from its own breast. There are many good accounts of eiders' breeding haunts and habits. These ducks are inhabitants of rocky coasts, and feed largely upon crustaceaus and molluscs. They are expert divers and swimmers, though slow on the wing.

The present species in its full plumage has the head white, with a pale green patch between the eye and the bill, and another on the back of the head. The throat and a ring round the neck are bluish-black; the chest, breast and flanks a fine orange; the back, outer edges of the scapulars, flight feathers, rump, tail, and abdomen black; the wing-coverts, shoulders, and inner edges of the scapulars white. The bill and legs are greyish-brown. The male is about 22 inches in length, the female a little smaller.

Snow mentions this species under the name of *Somateria stelleri* as being occasionally found on the Kuril Islands during winter; and Buturlin records it in his "Birds of the Ussuri-land." Dresser, reporting on the Russian Arctic Expedition, says that no nests of Steller's eider were found, hough it apparently breeds on the Taimyr Peninsula, also remarking that it was even rarer than the spectacled or Fischer's eider (*Arctonetta fischeri.*)

Steller's eider is also known to breed in Eastern Siberia, along the Aleutian Islands, and in Alaska.

378. Pacific Eider.

Somateria v-nigra, Gray.

Somateria v-nigra, Gray, Proc. Zool. Soc. Lond., 1855, p. p. 212, pl. CVII.

It is evident that this bird occurs in what may be called Manchurian waters, for, though Snow gives it as doubtful in his list of Kuril birds, it is known to breed in Northern Asia and so doubtless travels southward along the East Siberian coast to our region along with other related species during the winter months.

Clark records it as occurring at Agattu and Attu in the North Pacific, where its nests were found.

This bird has the head, neck, back, scapulars, wing-coverts, and upper breast white, with a black band through the eye, a pale green patch occupying the side of the head and upper neck, and a buffy washing on the chest and upper breast. The lower breast, flanks, flight feathers, rump, tail, and abdomen are black, with a large round white dot on the side of the abdomen behind the legs. It derives its name *v-nigra* from the fact that there is a peculiar black V on the throat.

The bill is greyish, the legs and toes yellow, with the web between the toes dusky. Length 23 inches.

379. King Eider.

Somateria spectabilis (L.)

Anas spectabilis, L. Syst. Nat., I, p. 195, 1766.

This handsome bird breeds according to Dresser in Western Taimyr on the northern coasts of Siberia. The laying commencing at the end of June or beginning of July. The nests are placed either on the steep banks of the tundra lakes or else in low-lying places near rivers and streams in the interior as well as near the sea, and they consist of "a round depression, not deep, about 25 c.m. in diameter, plentifully lined with rather coarse down, and containing six eggs. . . ." He further states that the bird often nests in company with geese and gulls.

This species is given by Stejneger as occurring in the Kuril Islands.

It has the head, neck, upper back, and upper breast white, with the face a fine orange edged with black, the cheeks and sides of the head pale green, the upper breast and upper back being faintly washed with buff. The rest of the plumage is black, except the wing-coverts and a large round patch or dot on the sides of the abdomen behind the legs, which are white. The bill is grey tipped with white; the legs and feet are yellow, the webs being dusky. Length, 23 inches.

380. Fischer's Eider.

Arctonetta fischeri, (Brandt.)

Fuligula (Lampronetta) fischeri, Brandt, Mém. Acad. Imp. Sci. St. Pétersburg, (Sci. Nat), ser. 6, vol. VI, pp. 8 and 10, 1847.

Next to the king eider, which is the commonest of the species breeding in Arctic Siberia, is Fischer's eider, which breeds also in Alaska, and winters in the Aleutian Island, and probable wanders as far south as the Kuril Islands. Dresser writes that it breeds in "the Yansk district and along the entire coast of the Arctic Ocean as far west as the Lena." It was found nesting round the lakes, sometimes on the island-lakes, but always a good distance from the sea, and was noticed to be less gregarious than the king eider.

The adult male in winter plumage has the top and back of the head pale green, a white patch edged with black encircling the eye, and giving the bird the appearance of wearing spectacles, on which account it is also known as the 'spectacled eider.' The throat, neck, lower-neck, back, scapulars, and wing-coverts are pure white, the rest of the plumage being black, except the characteristic round white patch on the sides of the abdomen. The bill, legs and feet are yellow. Length, 21 inches.

381. Eastern Velvet Scoter.

Oidemia stejnegeri, Ridgway.

Oidemia stejnegeri, Ridgway, Manual of North American Birds, p. 112, 1887.

Related to the eiders, and like them sea inhabiting ducks, are the scoters. These are all rather large birds of velvety black plumage, coarse oily flavour and surf-loving habits. They are winter visitors along the Manchurian and Chinese Coasts, retiring to the coasts and islands of the North Pacific to breed.

It is somewhat difficult to decide the correct names for the species that visit our region, the difficulty being to assign Pallas' name of *carbo** to any of the known species. We have it on the authority of both Russian and American ornithologists that *Oidemia stejnegeri*, Ridway (1887), and *O. americana*, Swainson (1831) both occur in our region, so that it is obvious that if Pallas was referring to either of these species then his name being the older is the correct one. As a matter of fact our present name *stejnegeri* is given in the British Museum catalogue of Birds (XXVII, 1895, p. 411) under *Œdemia carbo*, Pallas.

Giglioli and Salvadori record the third American species, *O. deglandi*, Bonpt., from Posiette Bay, but though this species is known to breed in Eastern Siberia, this record of it is believed to be incorrect.

Buturlin records *O. stejnegeri* from the Ussuri; while Clark records it as occurring in numbers off the Southern Kurils, and north of Yezo on September 30th and October 1st, but not later in the summer when the same place was passed.

**Anas carbo*, Pallas, Zoogr. Rosso-Asiatic, II, p. 244, 1811.

La Touche records *O. carbo* at Chin-wang Tao in February and April. It also occurs on the opposite shore of the Pe-chi-li Gulf, where it may be seen at Chefoo commonly throughout the winter. Indeed Adams describes seeing what he called surf-ducks being taken by the Chinese fishermen in their nets off Chefoo in great numbers.

Our species is of a fine velvet black with a white spot behind the eye, more extended backwards than in *O. deglandi*, and a white bar on the wing, which is more extensive than in the European form. The bill is orrange and crimson-lake, and has a prominent basal knob. The legs and toes are orange-red, the webs being dusky. Length 22 inches.

The female is blackish brown, without the basal knob on the bill or the bright colours.

382. Eastern Black Scoter.

Oidemia americana, Swainson.

Oidemia americana, Swainson in Swainson and Richardson's Faun. Bor.-Amer. II, p. 450, 1831.

The Eastern black scoter, or American scoter, as it is frequently called, is entirely black with a yellow bill, crimson at the sides. Length, 19 inches.

It differs from *O. nigra* of Europe in having the nail of the bill distinctly arched and decidedly hooked.

It has been recorded by Buturlin in his 'Birds of Ussuri-land,' Clark records it in Puget Sound (Alaska), while Captain Snow states that a few pairs breed on the northern islands of the Kurils. Giglioli and Salvadori state that H. R. H. Prince Thomas of Savoy secured a specimen of this species at Yamada in 1880. From these records it may be assumed that the bird is of fairly common occurrence along the East Asiatic coast, and is far from being confined to the Pacific coasts of North America.

383. Long-tailed Duck.

Harelda hyemalis (L.)

Anas glacialis et A. hyamelis, L. Syst. Nat., I, p. 203, 1766.

The long-tailed duck, or old-squaw as it is called in America, is not very common in Eastern Asia. Though very different from the scoters and the eiders, it is, nevertheless, mainly a sea duck, which probably accounts for the fewness of the times it has been recorded in our region.

Dresser reports that it was met with commonly everywhere by the members of the Russian Arctic Expedition. Indeed the species seems to be circumpolar in its breeding range.

David and Oustalet mention it as having been taken once at Taku (mouth of the Pei Ho, or Hai Ho, 30 miles from Tientsin, on the Pe-chi-li Gulf). A sportsman resident in Tientsin once described the bird to me, and said he had shot one at Huang-tsun to the north-west of that town. La Touche secured a young male and a female at Chin-wang Tao in the spring of 1916. Captain Snow records it from the Kurils, stating that it is very common in spring as it passes northward to breed. Buturlin records it from the Ussuri.

These are the only records I can discover, but they are sufficient to establish the fact of the bird's occurrence in our region; while Snow's observations point to its wintering somewhere along the East Asiatic coast or in the Japanese Islands.

In the summer the male has the crown, face, nape, throat, neck, scapulars, lower breast, flanks, under tail covert and outer tail feathers white; the side of the head including the eye occupied by a grey patch, with a brown patch below the ear. The chest, upper breast, wings, back, rump, and the long middle tail feathers, which give the bird its name, are brown, the dark brown of the back and wings being joined to that of the chest. The bill is short and thick at the base, and of a dark brown colour, with a pink patch near the tip. The legs and feet are pinkish.

The female has the top of the head, a patch below the ear, a narrow band on the chest, the back, wings, and middle tail feathers, which are not elongate as in the male, brown, the scapulars being greyish speckled with brown; the rest of the plumage white.

In winter the male has most of the head, neck, and upper parts dark brown, with a greyish patch on the side of the head, and the scapulars lighter brown: while the female has less white on the head and neck. Length of male, 21 inches including the long tail.

This bird is closely related in its structure to such birds as the golden eye, bufflehead and harlequin duck, which form a group of diving ducks that frequent the sea-shore during the winter months, though they may be found on inland waters during the spring and autumn migrations.

384. Harlequin Duck.

Histrionicus histrionicus, (L.)

Anas histrionicus, L., Syst. Nat., I, p. 204, 1766.

The beauiful harlequin duck, which owes its name to its extraordinary, almost garish, colours and markings, appears to be of fairly common occurrence in the Manchurian Region, though seldom, if ever, reaching neighbouring North China. It has been recorded at Olga Bay and from the Ussuri Region, by Giglioli and Salvadori and Buterlin, respectively; while Clark records seeing it at Simushir in the Kuril Islands, Snow also recording it as breeding commonly in the same region. Jouy's collection contains two specimens, one taken in Fusan Bay on March 14th, and one at Deer Island, near Fusan on December 14th.

Of a general dark slate grey, almost bluish grey, colour, rather darker above than below, and shading off into black on the wings and tail, the male has a white patch on the head in front of the eye, which is extended above the eye to the back of the head in a narrow band of a chestnut colour. There is a white dot below and behind the eye, and a white band edged with black down the side of the back of the head and upper neck, another similar band encircles the base of the neck, and another slightly lunar in shape on the side of the chest. The scapulars are white, a white band edging the wing-coverts, while the inner edges of some of the secondary flight feathers are white, a white patch also occurring on the side of the abdomen, behind the leg. The speculum is pale blue-grey. The flanks are a bright chestnut. The tail is rather long and pointed. Bill and legs, greyish-black. Length, 17 inches.

The female is brown above, reddish brown on the chest and flanks, and dirty white below, with three large white dots on the side of the head.

This bird, which breeds also in North-western America, is said to resort to the mountainous regions, where it makes its nest along the banks of mountain streams. Whether it does the same in our region is not clear for the observers quoted above are silent on this point, although one of them, Snow, records it as breeding in the Kurils. It is holarctic, or perhaps it would be better to say circumpolar in its distribution, for it is known in both the Eastern and Western Hemispheres in northerly latitudes.

385. Golden Eye.

Clangula clangula clangula (L.)

Anas clangula, L. Syst. Nat., I, p. 201, 1766.

The golden eye is common all over North China and Manchuria, where it frequents, during the spring and autumn, inland lakes and ponds, betaking itself, in winter to the coastal regions. Here it may be seen in the more sheltered bays often in large flocks.

The males, which are much fewer than the females, have the head black heavily glossed with green, a large white roundish spot occurring between the eye and the base of the short, thick-based bill. The neck, chest, and lower parts are pure white, the scapulars are white, edged with black, while the greater part of the wing-coverts and secondary flight feathers are white. The back, rump and tail are black. The bill is grey; the legs and feet orange. The eye is a bright golden yellow, giving the bird its name. Length about 16 inches.

The females, and males when in summer plumage, have the head brown, the foreneck and under parts white, clouded on the flanks with grey; the back of the neck, back, and wing-coverts grey; the secondaries white, the primaries blackish or dusky; the lower back, and tail black. The bill is brown, with a yellow band toward the tip; the legs and toes yellowish, with dusky web.

The golden eye is a diving duck, and will bring its food up from the bottom of lakes of considerable depth. It has a very flat body, and its flesh is extremely good eating.

Of so common occurrence is this species that reference to records of it are almost unnecessary; but it may be stated that Buturlin records it from the Ussuri region, while I saw it along the South Manchurian coast. It is well known to sportsmen at Newchwang at the mouth of the Liao River. Stejneger records it from the Kuril Islands.

Its place is taken in North America by a very closely related form *Clangula c. americana.*

386. Pochard.

Marila ferina, (L.)

Anas ferina, L. Syst. Nat., I, p. 203, 1766.

Though not so plentiful as the golden eye, the pochard is, nevertheless, fairly common in North China and the Manchurian Region. It does not figure so often in the sportsman's bag as some

other ducks on account of its habit of keeping more to open water than do such species as the mallard, teal, or pintail, which come in close to the reed beds to feed and are therefore more easily shot. The pochard is lacustrine in its haunts, and being a good diver, seeks it food like the golden eye often at considerable depths. Though of very rapid flight, it is thickset, rather heavy in build.

The male has the whole of the head and upper neck of a rich chestnut-red colour, the lower neck, chest and upper breast, as well as the lower back, upper and lower tail-coverts and tail, black. The rest of the plumage is of a vermiculated grey, the flight feathers being dusky. The bill is a bluish-grey, the tip black; the legs and feet dark grey; the eye red. Length 18 inches.

The female has the upper parts brown, the wings grey, and the lower parts whitish; the bill and legs as in the male.

The red crested pochard (*Marila rufina*, Pallas)* also occurs in Eastern Asia; but there do not appear to be any records of its having been taken or seen in our region, where, however, it probably occurs at least occasionally when on migration. Its true habitat is Southern and Eastern Europe, whence it ranges into India and China on the one hand, and to the British Isles on the other.

This species differs from the common pochard in having a crest, the bill vermilion, the front of the neck and chest dark brown, and a white speculum on the wing; the rest of the plumage being vermiculated grey as in *M. ferina*. The female has no crest and has the head and neck yellowish-white, speckled with white, the rest of the plumage brown, with no white speculum on the wing.

The places of these two forms are taken on the North American continent by the red-head (*M. americana*), and the far-famed canvas-back duck (*M. valisinaria*).

387. Baer's Duck.

Marila baeri, (Radde.)

Anas (*Fuligula*) *baeri*, Radde, Reis im Süden von Ost-Siberien in den Jahren 1855-1859, incl. Band II, pp. 376-378, pl. XV, 1863.

Baer's duck is one of the thick, broad-billed diving ducks, generally known as scaups. Though not very common, this species passes through North China and Manchuria during the migrations,

* *Anas rufina*, Pallas, Reise Russischen Reichs, II, pp. 328 and 713, 1773.

wintering along the Yang-tzu Valley and southward. Bianchi records it from Ying-kou at the mouth of the Liao River, South Manchuria, a specimen having been shot by Captain Karpow on April 15th. I secured a specimen near Tientsin on April 5th., and have seen others in the same district.

The head and neck are black, with an olivaceous green sheen, a white spot occurring in my specimen just below the lower mandible; the chest and upper breast are a rich, deep, chestnut-brown; the back, scapulars and wing-coverts are dark brown, very minutely spotted with a lighter colour; the flight feathers are dusky-brown, their inner webs being white, while the speculum is white, edged with brown; the tail feathers are brown; the lower breast, abdomen, and under tail-covert are white, the flanks brown. The bill is black; the legs grey; the eye white. Length, 18 inches.

The female is brown, rather darker on the head, chest, and upper breast, lighter below.

This handsome duck, which was discovered by Radde somewhere in the region of the Amur, is one of the later arrivals in the spring, and may be seen in such places as Tientsin after most other species have gone north.

388. Scaup Duck.

Marila marila, (L.)

Anas marila, L., Syst. Nat., I, p. 209, 1766.

The scaup duck has the head, neck, chest, and the middle of the back black, the head and upper neck being glossed with green. The shoulders and scapulars are finely vermiculated grey; wing-coverts grey; the tail and flight feathers brownish, with a white speculum; the lower breast, flanks, belly, and under tail-covert white, the posterior parts of the flanks being vermiculated with grey. The bill is blue-grey; the legs and feet grey, eye yellow. Length 18 inches.

The female has the head, neck, chest, and upper breast dark brown, the wings dusky with a white speculum, the tail dusky brown. The back and upper parts generally are of a speckled brownish-grey, as also are the flanks; the lower breast and belly are whitish. The face is white, the bill blue-grey, the legs grey.

The scaup occurs all over North China and Manchuria, having been recorded by Bianchi under the name of *Fuligula affinis mariloides*, Richards, from the mouth of the Liao River in South Manchuria on March 15th, a whole month earlier than his record of Baer's duck; by Ingram under the same name from Northern Kirin; and by Buturlin from the Ussuri.

It is very common on the Lower Yang-tzu in winter, where it finds ample sustenance along with many other species in the extensive reed-beds, and lagoons that occur in that area.

The ferruginous, or white-eyed duck (*Marila ferruginea*, L.) also probably occurs in the Manchurian Region, but there do not seem to be any records.

389. Tufted Duck.

Marila fuligula, (L.)

Anas fuligula, L., Syst. Nat., I, p. 207, 1766.

This species is, if anything, more common in our region than either of the foregoing. It is recorded by Bianchi from Ying-kou, a specimen having been shot on March 6th, and by La Touche as *Fuligula cristata*, L. at Hsieh-chia-ying, near Chin-wang Tao on March 27th and 29th. I have seen it in the Tientsin district.

The tufted duck, so called on account of its black crest, which curls downward over the back of the head, has the head, neck, chest, breast, wings, tail, under tail-covert and vent region black, with a purpl gloss on the head and neck, and a white speculum on the wing. The flanks, lower breast and belly are white. The bill is pale blue-grey; the legs and feet are dark blue-grey; the eye bright yellow. Lenth, 17 inches.

The female has the upper parts dark brown, the lower parts brownish-grey.

390. Shoveler.

Spatula clypeata, (L.)

Anas clypeata, L., Syst. Nat., I, p. 200, 1766.

One of the commonest of the ducks known to occur in the Manchurian Region is the shoveler, a bird that is holarctic in its distribution. I have frequently shot it in North China, and when on the Lower Sungari in 1915 found it breeding in the marshes

that lay on the northern bank of that river, near its junction with the Amur. Here some immature specimens were secured early in August. Schrenck also records it from the Amur, while it is well known to the sportsmen of Newchwang and Antung.

The shoveler may be recognized at once by its unusual bill, which is long, very wide at the end, with a comb-like fringe inside the margins. The head and upper neck in the male are black with a green and purple sheen or gloss, the black continuing down the back to the tail, though flecked with white on the upper back. The lower neck, chest, shoulders and anterior portions of the scapulars are white, with a few brown spots and a light washing of buff on the chest. The sides of the body near the base of the tail are also white; while the secondary wing-coverts are tipped with white. The wing-coverts are of a fine steely-blue, the same colour occurring on the outer web of some of the long scapulars, the middles of these being occupied with white, and the inner web black with a green gloss. The speculum is a bright, glossy green. The flight feathers and middle tail feathers are dusky-black, the side tail feathers white, the tail-coverts black with a blue-green gloss. The breast and lower parts are of a rich reddy-brown or chocolate, fading into light chestnut on the flanks, where a few black vermiculations occur. The bill is blackish; the legs are reddish orange; the eye red. Length 18 to 20 inches.

The female is of a uniform brown, speckled with black, the wing-coverts being bluish-grey, speculum greenish, quills dusky, middle tail feathers dusky, side ones white, bill yellowish grey, legs and feet yellowish.

391. Garganey.

Querquedula querquedula, (L.)

Anas querquedula et *A. circia*, L., Syst. Nat., I, p. 203 and 204, 1766.

The garganey, or summer teal, as it is frequently called, is also one of the species of duck that breeds in Manchuria and North China. While on the Sungari River near its junction with the Amur I secured adult and immature specimens in August. I also saw birds of this species in Central Kirin in June and July. It is common in North China as well, but arrives from the south much later than most of the other wild-fowl. It may be shot in May along with the late spring snipe, nor does it appear to commence laying its eggs till some time in June.

The male has the forehead, crown, nape, and back dark brown, the cheeks and neck light chocolate brown, finely streaked with white. There is a conspicuous white streak extending from above the eye to the back of the head and a little way down the neck. The wing-coverts are a fine bluish-grey edged with white, the speculum is green edged with white, the primary flight feathers and tail are brownish, while the scapulars are black with a white central stripe. The chin is black, the chest and upper breast pale brown with black scale-like markings, the lower breast, flanks, and belly white with black bands on the flanks. The under tail-covert is black with creamy-white edges. The bill is black, the legs greyish brown, the eye brown. Length 16 inches.

The female has the upper parts dusky, the feathers edged with light grey-brown. The cheeks and neck are greyish white, finely speckled with dusky, the breast and belly greyish white, speckled on the flanks, belly, and under tail-covert with dusky-brown. There is a dull white stripe over the eye. The wing coverts are greyish, as also is the speculum, by which feature and its larger bill it may be distinguished from the female of the common teal (*Nettion crecca.*)

392. Common Teal.

Nettion crecca, (L.)

Anas crecca, L. Fauna Suec., p. 45, 1746, and Syst Nat., I, p. 204, 1766.

So well known a bird as the common teal scarcely needs description. It is the commonest of the teals, if not of the whole duck family, occurring, as it does, in great numbers throughout Europe and Asia. Its place is taken on the American continent by the closely related *Nettion carolinensis*, that differs only in having a white crescentic band on the sides of the chest, just as the garganey is replaced by the famous blue-winged teal (*Querquedula discors*).

Though a few pairs of the common teal may stop off and breed in North China and Manchuria, by far the greater number pass through only on their way to more northerly breeding grounds.

It is one of the sights of Eastern China to see the tremendous flights of teal of this species that occur in both spring and autumn, and even throughout the winter in certain places on the Lower

Yang-tzu. The birds occur in these flights literally in millions. I have seen such a flight stretching from horizon to horizon, an almost solid mass of teal formed by countless v-shaped skeins, the noise of their wings as the roar of a passing train, as they passed high over head blackening the sky. Such flights have been witnessed in the Tientsin district, but more especially in that round Newchwang. At times they are of daily occurrece, taking place at exactly the same time each day, and following the same direction, from which it may be argued that the birds are travelling *en mass* between two chosen feeding grounds, or between feeding and resting grounds. At others from their direction and enormous height one must conclude that the birds are on migration. This wonder of the feathered world has to be seen to be believed.

The common teal has the forehead, crown, a narrow band down the nape, the face, cheeks, throat, and neck of a rich chestnut; the chin black, and a broad black band, heavily glossed with green, or it might be called a glossy green band, embracing the eye and extending to the back of the head and neck. This is margined with a narrow band of buff, which extends to the base of the bill. The chest is buff-brown speckled with small, round, black dots; the breast and belly are white, washed with buff or a light rusty brown. The lower neck, mantle, flanks, back, part of the scapulars, and region of the vent are vermiculated black and white. The wing coverts are dusky, edged with buff, the speculum brilliant green and velvet black, edged with white and chestnut. Some of the scapular feathers are velvet black on their outer, glossy white on their inner webs. The flight feathers and tail feathers are dusky-brown, the under tail-covert black with a buff patch on either side. The bill is black, the legs and feet greyish-brown, the eyes brown. Length 15 inches.

The female, like that of the garganey, is of a general dusky-brown speckled appearance, but is without the light eye-brow, and has a green speculum.

If any records of so common a species are needed to show its claim to a place in the Manchurian ornithology, it may be stated that Buturlin and Poljakev record it from the Ussuri, and Bianchi from Ying-kow.

393. Baikal Teal.

Nettion formosum, (Georgi.)

Anas formosa, Georgi, Reis., I, p. 168, 1775.

A somewhat larger and more handsome bird than the common teal, the Baikal, spectacled, or clucking teal, as it is alternatively called, is very abundant in Eastern China, where it winters in the south-eastern provinces, passing through the Manchurian Region on its way to breed in Siberia. I came across it in large flocks in Anhui province north of Nanking, where it was wintering in the small artificial lakes at the heads of the ravines, and again upon the Tai Hai, south of the Yang-tzu, and a little to the North-east of Wu-hu. I have also frequently shot it in the Tientsin district, and also saw it in Feng-tien and Kirin provinces of Manchuria in the spring of 1913. It evidently passes also up Eastern Manchuria, for Buturlin and Poljakow record it from the Ussuri, while Captain Karpow secured it at Ying-kou, at the mouth of the Liao River.

In this beautiful species the crown is black, lightly speckled with brown; a black band passes from the bottom of the white lower eyelid downwards joining the black chin and throat. The enclosed space in front of the eye is buff, edged with white. Behind the black band from the eye, occurs a broad buff band running parallel with it, and meeting with the corresponding one on the other side of the head on the lower neck. A white line passes backward from the eye, dividing the speckled crown from the glossy green of the back of the head. The back of the lower neck, shoulders, flanks, and part of the scapulars are a dark, vermiculated grey. The back, wing-coverts, primaries, rump, and tail feathers are dusky-brown. The speculum is glossy bronze-green, edged anteriorly with chestnut, posteriorly with black and white. The long feathers of the scapulars have the inner edge glossy white, the middle stripe velvet black, and the outer edge rich chestnut. The fore part of the lower neck and the chest are of a vinous-buff, spotted with numerous small round dots, and having a white crescentic bar on the sides; while the breast, and belly are buffy-white, the under tail-covert black, edged on either side with chestnut, and tipped with white. The bill is black; the legs and feet are brownish; the eye is brown. Length, 16½ inches.

The female closely resembles that of the common teal, but may be distinguished by the presence of a round, whitish dot between the eye and the base of the bill, as well as by its somewhat larger size.

394. Falcated Teal.

Eunetta falcata (Georgi).

Anas falcata, Georgi, Reis. I, p. 167, 1775.

The falcated teal is one of the handsomest of the wild-fowl common to Eastern Asia. Somewhat larger than the foregoing spectacled teal, the male in its full winter and spring plumage though less varied is every whit as beautiful. It has the crown and upper part of the crest of a deep glossy chocolate-brown, the sides of the head and lower part of the crest black, the whole suffused with a fine bronze-green sheen. The throat, upper neck and a spot above the base of the upper mandible are white. There is a black ring round the neck on the white part of the upper-neck. The lower neck and upper breast are heavily vermiculated with thick black lines on white, while the breast, flanks, back and upper scapulars are finely vermiculated black on white. The lower scapulars, which are strongly falcate, are black on the outer web with a narrow white margin, a white middle stripe, and black and grey on the inner web. These feathers are often over seven inches in length, and it is from them the bird derives its name. The tail-coverts are black, with triangular buff patches on their sides. The tail and primary flight feathers are greyish, the speculum green lined with white. The lower breast and belly are greyish-white. The bill and legs are grey. Length about 17 inches.

The female is of a general brown speckled with black.

I came across this bird breeding in the ponds and swamps of Central Kirin. Ingram records it as breeding in the Kinghan Mountains, where specimens were secured on June 6th and 14th. La Touche records it passing through Chin-wang Tao from March 15th to May 4th. It is common in the Tientsin district in early spring, and I also saw it in Eastern Fengtien not far from Kai-yuan. Jouy's collection contains three specimens from Corea. Captain Snow records it from the Kurils, Giglioli and Salvadori from Olga Bay, Schrenck from the Amur, and Poljakov from the Ussuri.

My friend Mr. H. E. Gibson of Shanghai tells me that the falcated teal is very plentiful in the Hang-chow Bay in Chekiang province during the winter, where he has often shot it. Doubtless it winters in the bays, inlets and estuaries of South and South-eastern China, and not so much on inland waters, such as the Lower Yang-tzu and adjoining lakes and marshes.

395. Gadwall.

Chaulelasmus streperus (L.)

Anas streperus, L. Syst. Nat., I, p. 200, 1766.

The gadwall is not very common in North China and the Manchurian Region, perhaps on account of this general region being somewhat out of its common range. That it passes through Manchuria, or at least some part of that country while on migration is evident, for I have secured it in the Tientsin district, while La Touche has recorded it at Chin-wang Tao. I have also shot it on the Lower Yang-tzu in late November. Snow gives it in his list of birds of the Kuril Islands, where, doubtless, and in Siberia it breeds.

The male has the head and upper neck light brown spotted with a darker brown. The lower neck, back and flanks are grey, the lower neck lightly barred or scaled with light grey, the back marked with white concentric half-rings, and the flanks vermiculated with white or light grey. The breast and belly are white, the lower back and rump, and upper and lower tail-coverts are black, the tail feathers grey. The upper scapulars are brown with dark centres, the lower scapulars grey. The anterior wing-coverts are mottled or speckled brown, the median wing-coverts a rich reddy-chestnut, the greater coverts black. The speculum is white, edged with black, and the flight feathers are greyish. The bill and legs are yellow, the eye brown. Length, 21 inches.

The female has most of the plumage speckled light and dark brown, the wing, however, being the same as in the male, but less brightly coloured.

396. Widgeon.

Mareca penelope (L.)

Anas penelope, L., Syst. Nat., I, p. 202, 1766.

The widgeon, so common in Great Britain, is decidedly rare in North China and Manchuria, though there are sufficient records to show that it occurs throughout our region. La Touche records it

as seen twice at Chin-wang Tao by him during the years 1911-13. I have seen three specimens shot in the Tientsin district. Snow mentions it in his notes on Kuril birds, while Buturlin and Poljakov both record it from the Ussuri. Schrenck also records it from the Amur.

It may be recognized by its rather distinct plumage. The head and neck are a rich chestnut red, the forehead and crown being creamy or yellowish white, while the cheeks and nape are minutely spotted with greenish-black. The chin and throat are black. The chest is a lighter chestnut than the head and neck, the breast being white. The wing-coverts also are white, the speculum green edged with black, the quills and tail feathers greyish black. The lower scapulars are black, edged with white, the under tail-covert black, preceded by a white patch on either side. The mantle, back, upper scapulars and flanks are vermiculated grey. The bill and legs are grey, the eye brown. Length, 18 inches.

The female is speckled greyish-brown above, greyish-white below, with greyish-green speculum.

397. Pintail Duck.

Dafila acuta (L.)

Anas acuta, L., Syst. Nat., I, p. 202, 1766.

A very common species of duck in certain parts of the Manchurian Region, and East China generally, and of rather striking appearance is the pintail, so called on account of its long, thin tail. It passes through the Tientsin district in great numbers, especially during the latter part of October or early in the spring. La Touche records it at Chin-wang Tao as early as February 25th, while on March 15th, 1913, he saw two or three hundred. Buturlin and Poljakov record it from the Ussuri.

Apparently it does not commonly winter in the Yang-tzu Valley, for Mr. H. E. Gibson, who has shot in that region over a period of fifteen or more years, tells me that as far as he is aware he has never seen one there. Doubtless this duck keeps more to the sea-shore, as it does in Great Britain. At the same time it certainly travels inland for I have shot specimens in the marshes near T'ai-yuan Fu in Shansi.

The pintail has a very long neck, rather slender body, and long pointed tail, all of which combine with its strongly marked, though not brightly coloured, plumage to give it an elegant appearance.

In the male the head is brown, the back of the upper neck black, or very dark brown, and divided from the brown of the head by a longitudinal strike of pure white, which continues down the side and front of the neck to the chest, breast and belly, all of which are white. The back part of the lower neck, mantle and flanks are vermiculated grey. The scapulars are long and black, edged with silvery grey or glossy white. The wing-coverts are brown, the greater coverts buffy yellow: the speculum is bluish purple, edged with black and white; the flight feathers are greyish-black. The long tail feathers are black, the short side ones greyish-white, the under tail-covert black. The bill and legs are bluish grey, the eye brown. The length, including the tail, is about 25 inches.

The female is light brown, speckled with dark brown, the speculum being olive-green lined with chestnut-buff.

398. Swinhoe's Duck.

Polionetta zonorhyncha, (Swinhoe.)

Anas zonorhyncha, Swinhoe, Ibis, 1866, p. 394.

With the mallard and the common teal the yellow-nib or Swinhoe's duck is one of the commonest of the East China and Manchurian ducks. Like the summer teal, or garganey, it breeds freely all over North China and Manchuria, as well, apparently, as in Siberia, Kamschatka and the Kuril Islands. It takes the place in these parts of the dusky, or black, duck (*Anas rubripes*) of North America, which bird it closely resembles. Appearing with almost the earliest species in these regions in spring, it may still be shot on migration in May. Many pairs stay behind to breed, others passing northward. In the autumn it is almost the first to appear again, which it does in immense numbers. I came accross it breeding in Manchuria in the Chao-yang Chên district of Eastern Fengtien, in the Upper Sungari basin, as well as on the Lower Sungari near its junction with the Amur. I have also found it breeding in Shansi, Shensi, Kansu, and Inner Mongolia, as well as in Chihli. Its favourite breeding haunts are the numerous marshes, or even on the banks of sedge- and reed-grown ponds, that

occur in all the river valleys of these regions. The nest is the usual shallow pit lined with sedge-grass and other materials, and a good thick layer of down. The eggs are large and of a greenish colour. After the breeding season it gathers into immense flocks, finally finding its way south to the splendid winter quarters of Middle China, and it may be found throughout the winter in Southern Chihli, Shansi and Shensi, practically the whole of Honan, Anhui, Southern Shantung, and the Yang-tzu Valley, especially in the lower reaches of the latter, and on southward throughout South China.

I am convinced, from its general appearance, that it is the ancestor of the larger and better strain of domestic ducks in China, though it is evident that the mallard also has been domesticated in this country.

The male has the crown, a line through the eye, the back of the neck, upper back, upper breast and wings of a dusky brown colour, the feathers of the upper back and breast being edged with light brown. The lower back, and lower breast are even darker brown, merging into black posteriorly on the rump, vent, and tail-coverts. The central tail feathers are black, the side ones brownish. A streak over the eye, the cheeks, throat, sides and front of neck are buff, finely streaked and speckled with dusky. The speculum is glossy green, edged posteriorly with white, the scapulars also being edged with whitish. The bill is black with an orange band towards the tip; the legs and feet are of a deep orange-red.

The female is like the male, but lighter on the head, breast, and upper back.

The length of the drake is 25 inches, the bird being the largest and heaviest of the edible, or perhaps it would be better to say, good eating ducks of these parts. The flesh is excellent.

Stejneger gives this species in his list of Kuril Island birds.

399. Mallard.

Anas boschas, L.

Anas boschas, L., Syst. Nat., I, p. 205, 1766.

Of all wild ducks the mallard is undoubtedly the best known, and certainly the most sought after by sportsmen. It is common all over the Northern Hemisphere, breeding in sub-arctic as well as north-temperate regions, and wintering wherever it may find

open water and suitable feeding grounds. It is distributed all over China and Manchuria, being particularly plentiful in marshy areas, such as those round Tientsin, though it is by no means uncommon along all the rivers and streams during the migrations. There is no need to give any records of its occurrence in our region, except, perhaps, that of Stejneger, who gives it in his list of Kuril Island birds, from which it is evident that it extends eastward into, and breeds in, Eastern Siberia.

The male has the head and upper neck of a fine glossy green, a white collar dividing this from the chocolate-brown of the lower neck, chest, and upper breast. The back of the lower neck and upper back are brown, the scapulars greyish, edged with chestnut-brown. The flanks, lower breast, and under parts are finely vermiculated grey; the lower back, rump, upper and lower tail-coverts are black. The two central tail feathers are black and curl upward in a characteristic fashion, the rest of the tail feathers being white. The flight feathers are greyish, the speculum bluish-purple edged with black, and then white. The wing-coverts are brownish. The bill is of a yellowish-green, or yellowish, the legs and feet bright orange, the eyes brown. Length 24 inches.

The female is speckled light and dark brown, with a yellowish band on the brownish or blackish bill, bluish-purple speculum, and yellowish legs and feet.

400. Ruddy Sheldrake.

Casarca rutila, (Pallas.)

Anas rutila, Pallas, Nov. Comm. Petrop., XIV, p. 579, pl. 22, fig. 1, 1769-70.

A very handsome, but as far as its food value is concerned a somewhat useless species, is the so-called ruddy sheldrake or Bramany duck. It is one of two species of sheldrake, or sheld-duck, that are very common in certain parts of Eastern Asia, and it may be distinguished by its general rich chestnut colour. The head in the male in winter plumage is pure white, the lower neck, back, chest, and breast are a rich orange-chestnut, the lower parts orange-brown; the scapulars and wing-coverts are white; the speculum green, and rather extensive; the quills and tail feathers black. The bill and legs are greyish-black, the eyes brown. Length, 26 inches.

The female, and male in summer, have the head washed with chestnut-buff, the same spoiling the whiteness of the scapulars.

This species is a large, heavy bird, totally unfit for the table, though it may be eaten after careful boiling by the hungry sportsman who can get nothing better. It breeds commonly along the Chinese and Mongolian borders, and in Mongolia itself, where the nest is made in some hollow amongst rocky screes, adjacent to some lagoon. Sometimes these nests occur on the crest of a hill at a considerable distance from any water, and it is a mystery how the parent birds, for they both attend the brood, get their young to the water they need. The fact that the species is well known at Newchwang, and has been reported by La Touche at Chin-wang Tao suggests that it breeds also in Western Manchuria, where that country borders Eastern Mongolia.

The bird, when on migration and during the winter months, occurs in flocks of from ten to forty, or even a hundred or more individuals, and its presence may soon be detected by its somewhat musical bugle-like call, which is readily distinguishable from those of the wild geese that frequent the same localities. By April the flocks have broken up, and the birds may be seen in pairs all over the country, being particularly plentiful in North-western China.

The species winters throughout Middle China and southward, being particularly plentiful in such areas as the Wei Valley in Shensi.

401. Common Sheldrake.

Tadorna tadorna (L.)

Anas tadorna, L., Syst. Nat., I, p. 195. 1766.

Anas cornuta, Gmelin, Reis. II, p. 185, pl. 19, 1774-84.

More of a marine species than the ruddy sheldrake, at least in winter, the common sheldrake is more plentiful in North Eastern China and Manchuria. It breeds in the same areas as the ruddy sheldrake, but makes its nest in burrows, excavated by itself, on the shores of the brackish lakes and lagoons so common in Inner Mongolia and the Ordos Desert.

In winter, however, it repairs to the sea-shore, and is never found in Central, or Middle China along the large rivers as is the case with the ruddy sheldrake.

La Touche has recorded it at Chin-wang Tao, and it is well known at Newchwang. I have seen it in the marshes between Tientsin and the sea, and also round the mouth of the Hai Ho and on the North Shantung coast. It doubtless breeds in Western Manchuria on the borders of Mongolia. A. Adams records the sheldrake at Saghalin Island.

This species has the head, upper neck, and upper scapulars black with a strong green sheen. The lower neck, wing-coverts, flanks, lower breast, belly, rump, upper tail-covert and tail-feathers are white, the lower breast and belly having a dark brown, irregular central line, which embraces the lower tail-covert. The chest, and upper back are chestnut, the lower scapulars brownish-grey, some of the secondary flight feathers being dark chestnut, the rest green, forming the speculum, while the primaries are black. The bill, which has a high basal knob, is of a bright vermilion; the legs and feet are fleshy pink; the eyes brown. Length about 26 inches.

The female has no basal knob on the bill, but is otherwise like the male, except that the colours are less bright.

402. Mandarin Teal.

Æx galericulata galericulata (L.)

Anas galericulata, L., Syst. Nat., I, p. 539, 1766.

Without any question the mandarin teal is the most beautiful of all the wild-fowl in or out of Eastern Asia. It is adorned in the winter and spring with the most gorgeous plumage, surpassing even that of the beautiful American wood-duck (*Æx sponsa*), the only other species in the genus. Not only does the mandarin teal possess plumage of bright but harmonious colours, it is also of elegant shape, and quick and active in its movements, so that altogether it is a most graceful bird.

Wintering on the Yang-tzu and in South China, the mandarin teal breeds in the forests of Manchuria, where it is one of the most characteristic features of the fauna of those regions. It also breeds in the Tung Ling forest of North-eastern Chihli, as well as in the forests of North-eastern Corea and Eastern Siberia. It is doubtful if it travels very far north, however, its true breeding grounds probably consisting of the Amur basin including its tributaries the Ussuri and Sungari Rivers.

The bird in migration apparently follows the China coast, some probably crossing to Corea from the mouth of the Yang-tzu, others from the Shantung Promontary to North Corea and South Manchuria. A few continue round the coast of the Pe-chi-li Gulf, or perhaps follow the Grand Canal all the way from the Yang-tzu, and pass through the Tientsin district probably on their way to the Tung Ling. La Touche has also recorded the species once at Chin-wang Tao. As the bird is common at Newchwang at the mouth of the Liao, and also at Antung at the mouth of the Yalu in spring, it is probable that the majority of those that breed in the Manchurian forests get there by way of these rivers. Giglioli and Salvadori also record it from Olga Bay on the Primorsk Coast.

I came across it breeding throughout the Kirin forest, finding it particularly plentiful on the Upper Sungari, and in the I-mien-po district, while Poljakov records it from the Ussuri.

The mandarin teal, like the wood duck, makes its nest in the hollow of some tree often at a considerable height above the ground. I have frequently seen the old birds perch on trees while trying to distract my attention from the young ones in some adjacent stream, and later in the year when the young have become fully fledged have seen whole families sitting on branches in tall trees, exactly as might a family of rooks or crows. When disturbed with their young the parents make a plaintive whistling noise, the only other sounds I heard these birds make being a sort of quiet clucking while playing with each other in the secluded ponds in the forest that they always visit at dusk. During the day they spend their time after the young have grown up, generally in pairs, feeding along the numerous streams that intersect the forests in every direction, gathering into small flocks as dusk approaches and making for one of the ponds already mentioned where they seem to disport themselves till long after dark. It is possible that they find some particular form of food in these ponds, which are deep, filled with weeds of various kinds, and contain certain species of fish, crustaceans and molluscs.

The male in winter plumage has the forehead and crown of a dark glossy green, and the upper part of the long crest a rich chocolate red. The sides of the head from the base of the bill and for a considerable distance above the eye are white, the white passing backward in the form of a narrow stripe through the crest,

the lower portion of which is a dark glossy green. The lower part of the face is chestnut-buff passing into a rich chestnut, finely streaked with white on the thick fringe of long narrow feathers that form what is practically a hood. The throat is a dull chestnut; the chest deep maroon with a purple gloss, and with alternate bands of black and white (three black and two white) on its sides. The mantle, back, wings, and tail are of an olivaceous brown glossed with green. The flight feathers are edged on the outerwebs with silvery white, the rest of their surface being glossed green. The innermost tertial in each wing is enormously expanded, especially the inner web, which is of a light chestnut colour, edged with white on its basal portion, and green- or blue-black on the apical portion. The outer web is also green- or blue-black, the same colour pervading the upper portion of the scapulars. The lower scapulars have the inner web white, the outer green- or blue-black. The breast, belly, and under tail-covert are white; the flanks light chestnut-brown, vermiculated with black, a velvet black band occurring at the base of the tail on either side, followed by a patch of deep chestnut. The bill is crimson, the legs and feet yellowish-brown. Length about 16 inches.

The expanded tertials are held erect over the back in a very elegant manner.

The female, as well as the male in summer plumage, has the upper parts, including the slight crest, of a dull olive-dusky, glossed with green on the mantle and back. The wing is without the enlarged inner tertial, but is otherwise as in the male when in winter plumage. The lower parts are white; chest and flanks dusky-brown, spotted with whitish pear-shaped dots. There is a much reduced white streak round the eye passing backward. The bill is brown, the legs and feet yellowish-brown. As a matter of fact the female of this species very closely resembles the female of the American wood duck, and there is no doubt about the close affinity of the two species, in spite of the fact that by some they are placed in separate genera.

Mr. Ausin H. Clark has recently named a new subspecies *Æx galericulata brunnescens** from Kuisiu Island, Japan, which he describes as follows:

* Proc. Biol. Soc. Wash. Vol. XXVII, pp. 87-88, May 11, 1914.

"This subspecies differs from the typical form in having the central stripe in the elongated feathers of the neck distinctly buffy instead of white; in having the black posterior border of the enlarged innermost tertial from 4 mm. to 5 mm. in width instead of from 2 mm. to 3 mm.; in having the border of the upper mandible adjacent to the sides of the face inclined anteriorly instead of being nearly perpendicular to the edges of the maxilla; and in being slightly larger."

The diagnosis of this new subspecies is based on two specimens, one from Kinsiu Island, the other from Shanghai, and one cannot help feeling that more material should be examined before it is admitted that two distinct forms actually occur in this region.

Sub-family ANSERINÆ (Geese)

There are at least ten species of geese that pass through the Manchurian Region while on migration between their breeding haunts and winter resorts. At the same time it is possible that some of them actually breed in certain parts of that country.

403. PACIFIC BRANT GOOSE.

Branta nigricans (Lawrence.)

Anser nigricans Lawrence, Ann. Lyc. New York, IV, p. 171, 1846.

The Pacific brant goose is probably the rarest of the geese known to occur in our region. It has occasionally been recorded on the China coast, whence it doubtless arrived by way of Japan or Corea. Dresser reports it as seen in great numbers in New Siberia by the members of the Russian Arctic Expedition of 1900-3, but further states that it breeds there only to a limited extent. The chief nesting place of this species was found to be on the tundras near the Arctic Ocean from the delta of the Yana River along the Rivers Syalakh and Mouksounovka and further east towards the River Khrom. The nests were placed in low-lying river-valleys where there were numerous pools of stagnant water, or near lakes not for from the coast.

Snow gives the brant goose as a visitor to the Kuril Islands.

It would seem, then, that this goose, wintering off Japan and other islands of the North-western Pacific, finds its way to the north of Siberia along the coasts, possibly of the Primorsk, but certainly of Kamschatka and Eastern Siberia.

The Pacific, or black brant, as it is usually called in that country, belongs more to the Pacific coasts of America, where it occurs in winter in large numbers, breeding well within the Arctic Circle from Point Barrow eastward to near Anderson River.

This bird, which is keenly sought after by sportsmen, affording them splendid sport as it comes in from the sea to feed along the foreshore, has the head, chest, primaries and tail feathers black; the rump, belly, tail-coverts and a patch on either side of the neck white, the latter being streaked with irregular black lines; the rest of the plumage dull leaden-grey, the edges of the feathers being of a little lighter shade than the rest. The point in which this brant is distinguishable from other closely allied species is that the white patches on the neck form an almost complete ring round the neck. The bill, legs and feet are black, the eyes brown. Length, 26 inches.

The females of this and all the following species resemble the males in plumage, being a little smaller.

404. Hutchins' Goose.

Branta canadensis hutchinsii (Richards)

Anser hutchinsii, Richard in Swainson and Richards, Fauna Bor.-Amer. II, p. 470, 1831.

Hutchin's goose, which is a subspecies of the well known Canada goose, as far as I have been able to discover, has not been recorded actually on the Manchurian mainland, but as Captain Snow records it from the Kurils, stating that a few have been noticed on Ushishir and Ekarma, and a nest with six eggs and another with seven having been found on May 16th, while young geese were found on June 20th, the bird may be included in our list.

Clark records this species as being "the most abundant bird on Agattu, where it breeds by thousands." Its breeding haunts are the Western Aleutian Islands, and along the northern coasts of Alaska, wintering all down the Pacific Coast as far south as California. This bird is also known popularly as the cackling goose, *Branta canadensis minima* apparently being a synonym of *B. c. hutchinsii*.

The species is simply a smaller and darker form of the Canada goose, true *canadensis*.

The head and neck are black, with a conspicuous white patch on either lower cheek, which, in some individuals, meet each other on the throat. A narrow white ring divides the black of the neck from the grey of the chest, which colour occupies also the back, wings, breast, and flanks. The rump abdomen, and upper and lower tail-coverts are white; the tail feathers and quills being dusky-black. Bill, legs, and feet, black. Length, 24 inches.

405. Snow Goose.

Chen hyperboreus hyperboreus, (Pallas).

Anser hyperboreus, Pallas, Spicil. Zool. VI, p. 25, 1767.

The snow goose breeds in Siberia. Dresser in his report on the observations of the members of the Russian Arctic Expedition states that it was found breeding in "the Yansk district from the estuaries of the Lena, on the plains of the Yana River, along the Syalakh and Mouksounovka Rivers, and even further north towards Sviatoi Nos."

The bird has been reported to me as passing through Inner Mongolia, having been observed near Harta (Chih-feng), and Kalgan, two towns on the North Chihli and South Mongolian border. It has not been observed, as far as I am aware, either at Tientsin or Chin-wang Tao. Its winter quarters on the western side of the Pacific are not known. It is possibly only a straggler in these regions, for the species is well known along the Pacific Coast of North America.

It has the plumage entirely white, except for the quills of the wings, which are black. The forehead and face are sometimes speckled with rusty-brown. The bill, legs, and feet are pink. Length, from 23 to 25 inches.

It is just possible that the so called David's swan (*Cygnus davidi*), which, since its discovery and description, has never again been recorded, and about which there is so much doubt and mystery, was nothing else but a swan goose with its black quills removed. Colour is lent to this theory, which was put forward by Alphéraky* as a solution of the mystery, by reason of the fact that the Chinese wild-fowlers invariably pluck out the long wing feathers of all

* Alpheraky, Geese of Europe and Asia, p. 13, 1905.

birds such as geese, swans, bustards and cranes, for which there is an independant market, before they offer the birds themselves for sale as food. David's specimen came from Taku, at the mouth of the Pei Ho, or Hai Ho, as it is also called, the river on which Tientsin stands, but unfortunately it was never sent to any European museum, being kept in Peking, and has now been completely lost sight of without any other competant ornithologist having examined it.

406. Chinese Swan-Goose.

Cygnopsis cygnoïdes, (L.)

Anas cygnoïdes, L., Faun. Suec., p. 108, 1746.

The Chinese swan-goose, which is more common in Japan than China, and passes through Manchuria while on migration, possibly also breeding in the Amur basin, where Schrenk has recorded it, may be recognized at once by its long, thin neck, and the large basal knob on the bill of the male. The crown and entire back part of the neck are of a rich, dark brown, the cheeks, throat, fore-part of the neck, chest, breast and lower parts being of a dull buffy-white. The feathers of the back, wings, and flanks are grey-brown, the margins being of a lighter shade. The flight-feathers are dusky, as also are the tail feathers, the latter being tipped with white. Length 36 inches.

Snow records this bird as passing through the Kurils, though not in large numbers.

This species is the ancestor of the domestic geese of Japan and China, amongst whom its exact colourings, markings, and form may often be seen; though the domestic birds are, of course, larger.

407. Eastern Grey Goose.

Anser rubrirostris, Hodgson.

Anser rubrirostris, Hodgson, Icon. Ined. in Mus. Brit. III, p. 129, specimen *e*, 1844.

This is a large bird, very like the European grey, or grey-lag, goose, *Anser cinereus*.

It has the plumage of the head, neck, and upper parts, including the flanks, of a greyish-brown; the lower breast and abdomen being dull white, the rump and wing-coverts slate-grey, the quills

dusky-black, and the tail feathers dusky-black edged and tipped with white. The feathers of the back, wings, and flanks are all edged with a lighter shade of grey-brown, which gives the plumage a barred appearance. The bill and legs are of a flesh-pink colour, the eyes brown, while the bird measures 36 inches in length, and weighs as much as 10 lbs.

This species is not very common in these parts. It may easily be distinguished from the other species that occur by its grey plumage and pink bill and legs, which render it recognizable even at a distance.

I have come across it breeding in the lagoons of the Ordos Desert, and in Inner Mongolia. La Touche records it twice at Hsieh-chia-ying near Chin-wang Tao, and it is probable that it breeds also in Western Manchuria on the East Mongolian border.

408. White-fronted Goose.

Anser albifrons albifrons, (Scopoli.)

Branta albifrons, Scopoli, Ann. I. Hist. Nat., p. 66, 1769.

A few flocks of white-fronted geese apparently pass through Western Manchuria on their way from the Yang-tzu Valley and South China to their breeding grounds in Siberia, for La Touche records this bird at Chin-wang Tao. Dresser reports, on the authority of the Russian Arctic Expedition members, that it breeds commonly in New Siberia Island, and all along the Siberian coast and rivers. It is probable, however, that the majority of these geese pass along the Corean and East Manchurian coasts, as well as by way of the Kuril Islands and Kamschatka.

As already indicated, the species winters in the Lower Yang-tzu basin and South China, where it is so plentiful that Wade calls it the common goose of China. This statement does not hold good for North China, however, for during the many years that I have hunted and explored throughout that country, I have not once seen a specimen. This further supports my opinion that the white-fronted goose, and its smaller relation the lesser white-fronted goose, generally cross the sea from the mouth of the Yang-tzu to Corea, some few at most following the China Coast as far as Northern Shantung, and crossing the Pe-chi-li Gulf to the mouth of the Yalu and Liao Rivers, and other parts of the South Manchurian

Coast. Giglioli and Salvadori record this bird from Fusan in Corea, while Jouy's collection also contains specimens from the same country.

In the latter collection, according to Mr. Austin H. Clark, there are also specimens of the American white-fronted goose (*Anser albifrons gambeli*, Hartlaub,) so that it would seem that Eastern Asia is the meeting place of the two forms of the larger white-fronted geese.

Our species has the forehead and area round the base of the bill white. The rest of the head and upper parts are brownish-ash-grey, much browner than in the grey goose, though less brown than in the various forms of bean-goose. The breast and belly are brownish, broadly and irregularly barred with black and white. The rump and lower back are black, the under and upper tail-coverts white, the tail feathers being dusky-blacked edged and tipped with white. The greater wing-coverts are tipped with white, the quills are blackish, edged on the outer web with ashy-grey. The bill is pale pinky-yellow, the legs light orange. Length, 27 inches.

When on the Tai-ping Marsh to the north-east of Wu-hu on the Lower Yang-tzu, I saw great numbers of these geese in November, which were apparently wintering in that region. They associated freely with other species, and I even secured white-fronted and bean geese from the same skein.

409. Lesser White-fronted Goose.

Anser erythropus, L.

Anser erythropus, L. Faun Suec. p. 116, 1746.

The lesser white-fronted goose may be distinguished from its larger relation by its smaller size, the fact that the nail of the bill is black, and that the eyelids are orange or pink instead of brown. Otherwise the two birds are alike. The length of the lesser white-fronted goose is 24 inches.

La Touche records it at Chin-wang Tao twice. I have never encountered it in North China. It breeds in Siberia, and, as far as our region is concerned, passes through on migration, wintering along the Yang-tzu Valley and in South China.

410. Bean Goose.

Anser segetum, Gmelin.

Anser segetum, Gmelin, Syst. Nat., I, p. 512, 1788.

The bean goose may be called the common goose of North China and Manchuria. It breeds in the latter country along the Lower Sungari and Amur Valleys, but not in any very great numbers, Siberia forming its true breeding grounds.

It is browner in its plumage than the white-fronted goose, from which it is readily distinguished even in flight and at a distance, by the absence of white on the face, and its dark bill, as well as its perfectly plain under parts.

The plumage of the head, neck, and upper parts are brown, with a tendency to ashy-grey on the wings, the lower back being black. The quills are dusky, as also are the tail feathers, these being tipped wih white. The breast is of a dull brownish-white, the region of the vent and under and upper tail-coverts white. In some of the older birds the head, neck, and breast have a tendency to a rusty washing of the feathers. The bill is black with an orange band across the end, behind the nail, and it measures about 70 mm. in length. The legs and feet are of a bright orange, the eye brown. The total length is about 34 inches, the weight being 5 lbs. to 7 lbs. or a little over.

411. Long-billed Bean Goose.

Anser middendorffi, Severtzoff.

Anser middendorffi, Severtzoff, Turkest. Jevotnic, 1873, pp. 70 and 149.

This goose, which might almost be considered a subspecies of the bean goose (*Anser segetunn*), is probably the largest known species. It closely resembles the bean goose in appearance, but is distinctly lighter on the head and neck, and more ashy on the upper parts. The bill measures up to 86 mm. The bird is also larger. Specimens which were taken in the Tai-ping marsh in the Lower Yang-tzu Valley, and which I measured were 38¼ and 39 inches in length, respectively. Both these birds weighed 10 lbs. My friend Mr. H. E. Gibson shot a specimen in the same locality in November 1915 that weighed 13½ lbs., while there is a record of one shot in the Tientsin district that weighed 12 lbs.

As regards the distribution of these species there is evidence to show that it corresponds with that of the common bean goose, I have encountered it in Shansi, while La Touche records it at Chin-wang Tao. Stejneger gives it, but neither *A. segetum* nor *A. serrirostris* as occurring in the Kurils. The species, if indeed it be such, occurs along the East Siberian coasts, where it was first discovered.

412. Thick-billed Bean Goose.

Anser serrirostris, Swinhoe.

Anser segetumn, var. *serrirostris*, Swinhoe, Proc. Zool. Soc. Lond., 1871, p. 417.

This goose is also heavier and generally speaking larger than the common bean goose. I measured and weighed a specimen shot by Mr. H. E. Gibson on the Tai-ping Marsh, which was 35 inches in length and tipped the scale at 9 lbs., as against 36 inches, and 7¼ lbs. in the largest of the common bean geese shot in the locality. The bird may be recognized by its heavy build, thick, heavily serrated bill, and comparatively heavy head. The bill is but little longer, though very much deeper, especially as regards the lower mandible, than that of the common bean goose. The plumage also is darker than either of the other two forms of bean goose.

Its range corresponds with that of the long billed bean goose. Snow gives it as passing through the Kuril Islands (though Stejneger later gives only *A. middendorffi*), while La Touche records it at Chin-wang Tao.

Captain Karpow secured what was probably one of this form at Ying-tzu (near Newchwang), which was called *Anser segetum mentalis* by Alphéraky in his "Geese of Europe and Asia."

Sub-Family Cygninæ (Swans)

There seems to be some doubt in regard to the number of species of swan that occur in East Asia in general, and in the Manchurian Region in particular. But in any case it is beyond doubt that at least two species occur, and probably four, unless we include David's swan—already referred to as extremely doubtful—, in which case the number would be increased to five. The two certain species are the whooper or whistling swan (*Olor cygnus*), and Jankowski's swan (*Olor jankowskii*), while it appears that Yarrell's *O. bewicki* and the mute swan (*Euolor olor*) also occur thus far east.

413. Whooper Swan.

Olor cygnus, (L.)

Anas cygnus, L. Syst. Nat., I, p. 194, 1766.

The whooper swan, or whooper as it is often called, is the common swan of these parts. It breeds very far north, wintering in certain parts of Central and South China. One of its wintering places is the great salt lake of South Shansi near Yün-ch'êng. Here it has been shot by European sportsmen, whose photographs of their bags leave no room to doubt the species. I have also seen this bird, literally in hundreds, in certain marshes to the north of Pukow in the Lower Yang-tzu Valley. It passes through the Tientsin district, as well as Newchwang at the mouth of the Liao, and Antung at the Yalu mouth during the migrations, and breeds in East Siberia. With regard to its breeding range, Buturlin, in defining the breeding ranges of Bewick's and Jankowski's swans (*Olor bewicki*, and *O. jankowskii*) as lying to the west and east, respectively, of the Lena delta in Northern Siberia, says that *O. cygnus* (which he calls *Cygnus musicus*) does not breed so far north as this, at least in Siberia.

Captain Snow states that a few of these birds frequent the Kuril Islands. Clark, in his report on Jouy's Corean collection states that there is a specimen of this swan in the National Museum (U.S.) collected by Dr. W. L. Smith in South-western Corea.

The whooper swan is a large bird, having a long bill, without a basal knob, as in the mute swan (*Euolor olor*).* The bill is dark yellow, almost orange, at the base, and for two thirds of its length, the terminal third being black. The plumage is white, often flecked on the head and neck with rusty, and on the body with grey, but this, apparently, is only in immature birds. Its length is 60 inches. Buturlin gives as the wing measurement of adult 570-610 mm. The bird weighs as much as 25 lbs. or 26 lbs.

* In "The Austral Avian Record." Vol. III, No. 5, p. 17, G. M. Mathews and T. Iredale propose *Euolor* as a new generic name for the mute swan: thus *Euolor olor* becomes the correct designation for the recently accepted *Olor olor;* while *Olor cygnus* remains the name for the whistling swan.

The Bean Goose (*Anser segetum*, Gm.).

A pair of Jankowski's Swans (*Olor jankowskii*, Alph.), captured at Chin-wang Tao, N. E. Chihli.

Photos by J. D. de La Touche.

Jankowski's Swan.

414. Mute Swan.

Euolor olor (Gm.)

Anas olor, Gmelin, Syst. Nat., I, 2, p. 500, 1789.

The inclusion of the mute swan amongst the birds of the Manchurian Region is based first on Taczanowski's statement in reporting upon Kalinowski's collection of birds from Corea that *Cygnus olor* occurs in that country. Secondly, there are two records of this bird's occurrence in China. In the museum of the Royal Asiatic Society (North China Branch) at Shanghai there is a specimen of the mute swan presented by a Mr. Boland, and said to have come from Chinkiang on the Lower Yang-tzu River. The species has also been recorded from North China.

It must be borne in mind, however, that specimens of this species of swan have been imported from Europe and turned down on artificial waters, and there is a possibility of some of these having escaped and been shot by enthusiastic sportsmen.*

In any case, if the species does actually occur in a wild state in Eastern Asia, it must be only as a rare straggler and not as a regular visitor.

The mute swan may be distinguished from any of the other species by the presence of the pronounced knob at the top and base of the bill. The bill is orange except for the extreme tip, the base and the knob, which are black; while the bare part of the face which reaches to the eye is also black. In size the species is about equal to the whooper, perhaps a little heavier in build. Its plumage is pure white.

It is this species that is partly domesticated in Great Britain and other countries in Europe, where it frequents artificial and preserved waters, itself being strictly protected either by the crown or the government of the country. In a wild state it occurs in Europe and Siberia.

415. Jankowski's Swan.

Olor jankowskii, (Alphéraky.)

Cygnus bewicki jankowskii, Alphéraky, Nature and Sport, (Prirodai Okhota), Sept. 1904, p. 10. (in Russian).

This swan, which appears to be fairly common in the Man-

* The Rev. George D. Wilder of Peking informs me that two mute swans have been bought within the last few years in the game market at Peking, and they had certainly been shot wild. This establishes the occurrence of the species at these parts beyond doubt. Dr. J. C. Ferguson has in his possession a life-like painting of the mute swan, done by an artist of the Ming Dynasty, and called the "red-billed heavenly goose," heavenly goose being the common Chinese name for the swan.

churian Region, is a purely eastern form. It may be distinguished from the whooper by its smaller size, its usually pure white plumage, and the fact that the yellow of the bill is lemon-colour, and occupies only the basal third, the rest of the bill being black, and from Yarrell's *Olor bewicki* in being larger. Its legs and feet are black; total length, about 50 inches.

I saw some of these swans in the Public Gardens at Dalny (Dairen), where the keeper told me they had been taken in the vicinity. La Touche records it at Chin-wang Tao, where, indeed, he kept for some time a pair of live ones that he had bought from local hunters. Bianchi records it from Ying-tzu, at the mouth of the Liao, while Giglioli and Salvadori* mistakenly refer two specimens of this bird from Posiette Bay near the border of North-eastern Corea and Manchuria to that very doubtful form known as David's swan (*Cygnus davidi*, Sw.)

According to Buturlin in a letter to the *Ibis*, published in Vol. I, pp. 651-652, 1907, *jankowskii* breeds in the tundras of North-eastern Siberia from the Lena Delta eastward, while *bewicki* breeds from the same point westward. He collected specimens of both these forms, as well, apparently, as of *O. cygnus*, which, as already stated, he says does not breed so far north.

416. Bewick's Swan.

Olor bewicki, (Yarrell.)

Cygnus bewicki, Yarrell, Trans. Linn. Soc. XVI, 2, p. 453, 1830.

Like *Olor jankowskii*, but smaller, this swan is, properly speaking, an inhabitant of Europe and Western Asia, but, as it is probably a straggler in Eastern Asia, I give it here in my list of birds of the Manchurian Region. As already stated Buturlin gives its breeding range as the tundras of Northern Siberia from the Lena Delta westward. This observer gives its wing measurement in the adult as 500-520 mm. as against 490-550 mm. in *jankowskii*.

It is just possible that the smaller of the two swans kept by La Touche at Chin-wang Tao, as already mentioned, was a specimen of *bewicki*, and not *jankowskii*, as supposed by him and Père Courtois of the Sikawei Museum, Shanghai, to whom they were sent.

* P. Z. S., 1887, pp. 580-596.

CHAPTER X.

The Marine Birds of the Manchurian Coast and Neighbouring Seas.

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The Marine Birds of the Manchurian Coast and neighbouring Seas.

We now come to a class of birds that are, generally speaking, less well known even to the ardent bird lover than are the land-birds or inhabitants of inland waters. I refer to what may be called the sea-birds, amongst which are to be included the petrels, albatrosses, auks, guillemots, puffins, gulls, terns, and skuas, nearly all of which keep entirely to the open sea or rugged coast-line. They are all migratory in their habits, but, travelling as they do usually some little distance out to sea, are not often observed by those on the watch for bird movements, unless they happen to be stationed on some lonely island or light-ship.

As regards the sea-birds of the Manchurian Region we should know little enough about them were it not for the pioneer work of such men as Steller, Pallas, and Schrenck, followed by Snow and others, whose extended observations on the bleak, storm-swept Kuril Islands and in the leaden seas of the Okhotsk and Japan, have confirmed and added to the work of the earlier explorers.

In more recent years American naturalists such as Mr. Austin H. Clark, who was a member of the personel of the United States Fisheries steamer "Albatross" during her cruize in the Northern Pacific, and Dr. Leonard Stejneger, who visited the Kuril Islands and collected some specimens of birds in 1896, have greatly added to our knowledge of the marine ornithology of these inhospitable regions. The latter in his paper "The Birds of the Kuril Islands" published in the *Proceedings of the United States National Museum, Vol XXI, pp. 269-296, 1899*, brings the list up to that date, basing it, as he himself says, upon his own collection and those made by Steller, Merck, Langsdroff, and Wosnessenski (the last in 1845-46 and referred to by Brandt, Middendorff and Schrenck), and that by Captain H. J. Snow, which was reported upon by Captain Blakiston and Mr. Pryer in their "Birds of Japan" published in the *Transactions of the Asiatic Society of Japan, Vol. X, pp. 84-186, 1882.*

A look at the map of our region will betray the fact that as regards Manchuria itself, her coast-line is divided into two sections by the Corean Peninsula. What may be called the South Manchurian Coast forms the northern boundary of the Gulf of Pe-chi-li including the Liao-tung Gulf, as well as of the Yalu Gulf, a northern extension of the Yellow Sea. These lie to the west of Corea. Eastward we have the East Manchurian, or Primorsk Coast, which is washed by the Japanese Sea to the south, being shielded from the Okhotsk Sea by the Island of Saghalin to the north, while the country to the north of the Amur mouth, which also belongs to our region, is washed by the Okhotsk Sea.

It is this eastern coast-line, and the Islands of Yezo, Saghalin, and the Kurils that support the greater portion of the sea-birds of these regions, as they pass northward and southward in their seasonal migrations. In their southward winter migration they fail to reach the South Manchurian Coast because Corea comes in the way and deflects them towards the southern islands of Japan and the islands of the China Sea. Thus such birds as guillemots, puffins, and auks are seldom if ever seen off the South Manchurian Coast, where the marine ornithology is confined mainly to certain gulls, terns, petrels, an occasional albatross, and, very rarely, skuas.

Stejneger remarks of the Kuril Islands that they are the meeting ground of two faunas namely the Japanese and Kamschatkan, but I doubt if this applies to the sea-birds most of which belong to the North Pacific fauna and cannot be considered in any way local.

Before embarking upon detailed descriptions of the marine birds of these parts, I should like to point out how very difficult it is to identify them, especially when it is only possible to view them at a distance. There are so many closely similar species, resembling each other both in form and colour, and also the plumages of most of them vary to such an extent according to season, that even experts must often be baffled; while it is probable that the inexperienced will frequently find himself at fault in naming a species even with the bird actually in hand.

Another difficulty is that in many species the individuals in different areas assume widely differing plumage, making them almost unrecognizable. Notably is this the case with the fulmar petrel, which is white in some parts of the Pacific, but in the Okhotsk region is of a dark, dusky-brown.

Nevertheless, we may confidently accept the records of the above mentioned observers, for in nearly every case they have been corroborated by subsequent observations by thoroughly competent ornithologists, who have gone over and corrected such errors as may have occurred in the nomenclature used.

Family Procellariidæ, (Petrels, Shearwaters and Albatrosses.)

This interesting group of sea-birds, which includes the shearwaters' petrels, and albatrosses, commonly known as the Tubinares, because of the peculiar tubular formation of their nostrils, is fairly well represented in the Japan Sea, along the Kurils and in the Sea of Okhotsk, though not well represented off the South Manchurian Coast. Some of the petrels breed on Saghalin Island and the Kurils; though I can find no records of the shearwaters doing so. Altogether some eight forms are to be included in our list.

417. Siebald's Shearwater.

Puffinus leucomelas (Temminck).

Procellaria leucomelas, Temminck, Planches Coloreés, No. 587, 1836.

This bird appears to be somewhat more southerly in its range than most of the sea-birds of our region, and might even be considered as belonging to the Japanese avi-fauna. Louis Jouy secured a specimen off Fusan, on the south-eastern coast of Corea on May 18th, 1884; while Clark records it as being common in the Sea of Japan, off the Corean Coast, increasing in numbers to the south and along the Japanese Coasts.

It may be recognized by its dark, dull grey-brown upper parts, speckled with white on the head, and white lower parts. The wings and tail are of the same dull brown as the back and upper parts; while the bill is of a pale horny yellow, the legs and feet flesh-coloured. Length, about 19 inches.

418. Slender-billed Shearwater.

Puffinus tenuirostris (Temminck.)

Procellaria tenuirostris, Temminck, Planches Colorées, text to No. 587, 1835.

Captain Snow records this species as inhabiting the northern islands of the Kurils, but distinctly says that it does not breed there. Clark records having observed it near the southern Kuril Islands in

the Sea of Okhotsk on September 30th. It is known to breed on the coasts of Van Diemen's Land and New Zealand.

According to Seebohm this shearwater is of an almost uniform brown, with pale grey under wing-coverts, and dark bill and legs. Other authorities describe it as dark sooty-slate above; deep sooty-grey beneath, paler on the throat, sometimes inclined to whitish. Its length is 13 inches.

419. Sooty Shearwater.

Puffinus griseus (Gmelin.)

Procellaria grisea, Gmelin, Syst. Nat., I, p. 564, 1788.

This species is of a uniform dusky-black or brown colour above, a little lighter below, and white on the under wing-coverts. Bill and legs, black: length, about 18 inches.

Its range is very wide, extending from Europe to the waters off the east coast of Asia. It is doubtful if it breeds anywhere in the vicinity of the Manchurian Coasts. Clark records having seen a number of birds of this species south-east of Cape Patience, Saghalin, on September 26th; while Snow, years before, gave it in his list of Kuril birds, stating that it occurs round the southern islands.

420. Grey Fork-tailed Petrel.

Oceanodroma furcata (Gmelin.)

Procellaria furcata, Gmelin, Syst. Nat., I, p. 561, 1788.

The range of this little petrel is very wide, extending, as it does, all over the Pacific from California to the mouth of the Amur. Snow states that it breeds in the Kuril Islands. According to him the birds of this species "make no nest, but deposit their egg [one, pure white, laid in June] beneath boulders and in crevices of the rocks and cliffs, in company with the auks and pigeon guillemots." Clark reports finding it rather common off the Kurils; while it is also known to breed in the Aleutian Islands.

According to Seebohm this bird has the plumage of a uniform pale slate-grey, shading into white on the under tail-covert, the tips of the scapulars, and on the tertials, and into dark brown on the axillaries, under wing-coverts, lesser wing-coverts, and ear-coverts. The feathers of the forked tail are scolloped at the end,

The Mute Swan (*Euolor olor*). Note the basal knob on the bills. Though these are semi-tame birds, this swan also exists in a wild state, and is occasionally shot in China and neighbouring regions.

Leach's Fork-tailed Petrel (*Oceanodroma leucorrhoa*), taken on board a steamer not far from North Japan.

in which characteristic, with the following species, this petrel differs from all others. These two species are further distinguished by the absence of the white patch on the rump. Length, 8 inches.

421. Leach's Fork-tailed Petrel.

Oceanodroma leucorrhoa (Vieillot.)

Procellaria leucorrhoa, Vieillot, Nouv. Dict. Hist. Nat., ed. 2, XXV, p. 422, 1817.

This bird is somewhat larger than the common storm petrel, or Mother Cary's chicken, but otherwise closely resembles it. It has the upper parts sooty brownish-black, the feathers of the tail-coverts being white at their bases, the edges of the wing-coverts slightly edged with white, the under parts sooty brown. The tail is forked, the feathers being scalloped at their ends, in both of which particulars it is further distinguishable from the common storm petrel. The bill, legs, and feet are black. Length, 8½ inches.

Clark records this species as common off Saghalin Island. As it is a nocturnal species, the members of the expedition apparently had to form their idea of its abundance or otherwise by its cries at night, for Clark states that the greatest numbers were heard on the night of August 16th (1906). From the fact that it occurred in these parts at that time of year in such numbers, it is not unreasonable to suppose that it breeds somewhere in the vicinity, and, as a matter of fact, we have it on Captain Snow's authority that it breeds in the Kurils, where its nesting habits are the same as those of the grey fork-tailed petrel, *i.e.* it lays one white egg in June, beneath a boulder or in a crevice of the rocks or cliffs. This is somewhat different from the habits of the birds of this species that breed on St. Kilda and North Rona Island in the British Isles. Here the birds apparently excavate burrows in the soft, peaty soil, two or three feet deep, in which they make a slight nest of dry grass.

The species is recorded by Schrenck from the Amur as *Thalassidroma leachii*, Temminck.

422. Pacific Fulmar.

Fulmaris glacialis glupischa, Stejneger.

Fulmaris glacialis glupischa, Stejneger, Auk, I, p. 234, 1884.

This, the largest of the petrels, appears to be of common occurrence in the seas off the Manchurian Coasts and the mouth of the Amur.

There are two phases in its plumage, one light and the other dark. In the light phase the head, neck, breast, and underparts are white, the back, wings and tail of a pearl, or even slaty, grey. In the dark phase the head, neck, upper and lower parts are of an ashy-brown, the back and wings being even darker. The bill is yellow, the legs and feet grey, the eyes black. Length, 19 inches.

Clark states that large numbers of this species were seen in the Sea of Okhotsk off Kamschatka and right down the Kurils to Hakkodate, but very few were in the light plumage.

Snow mentions *Fulmaris glacialis rodgersi* as rare in the Kurils, though the above named bird, which he calls *Fulmar pacificus*, he says "is common all along the Kurils; but more particularly about the central islands." To judge from Stejneger's list, both the above records refer to our present form, which was described by him in 1884.

From Snow's account we may gather that this bird breeds freely on the Kuril Islands, laying its single white egg on the grassy tufts and ledges of the cliffs. He expatiates upon the quality and flavour of the eggs of the fulmar, the first of which he says are laid about June 15th.

423. Black-footed Albatross.

Diomedea nigripes, Audubon.

Diomedea nigripes, Audubon, Orn. Biogr. V, p. 327, 1839.

This bird was found by the members of the "Albatross" expedition to occur off Saghalin Island and Yezo, while Captain Snow states that it is common round the Kurils throughout the summer, but does not breed there, probably, in common with the other albatrosses and shearwaters visiting "some of the small islands in or near the tropics during the winter months for that purpose."

The species is sooty-brown above, lighter below, shading into pale brown or whitish round the base of the bill. The bill, legs and feet are blackish. Length, 28 inches.

424. Short-tailed Albatross.

Diomedea albatrus, Pallas.

Diomedea albatrus, Pallas, Spicilegia Zoologica, pt. V, p. 28, 1780.

Mr. Clark says of this albatross "On October 1 this species was very common about the southern end of the Kurils, on both the inside and outside of the chain." From this it may be taken that

it occurs at least as far north as the mouth of the Amur. Louis Jouy's collection contains two specimens of this bird, one without data, the other from the Corean Straits at Tsushima on June 2nd. The species is also known from the Pe-chi-li Gulf, where it has been captured in fishermen's nets, notably off Chefoo, where I have seen specimens so taken.

This large bird is white, with straw yellow on the head, the wings and tail being grey-brown. The bill and legs are pale horn colour. Length, 37 inches.

Captain Snow does not give this species in his list as occurring off the Kurils, but mentions *Diomedea derogata* and *D. brachyura*, neither of which names appear in Stejneger's list. The latter authority includes *D. albatrus* in his list.

Family Alcidæ. (Auks, Murres, Guillemots, and Puffins).

The members of this family, which is represented in our region by some thirteen species, may be recognized by their small wings and short tails. Though capable of flying swiftly and strongly, they cannot begin to compare with such birds as the petrels, gulls, or skuas. Indeed their flying seems to be mainly confined to travelling to and from their nests on the cliffs and their feeding haunts at a greater or lesser distance sea-wards.

On the other hand they are expert swimmers and divers, and seem to take the place in northern latitudes of the penguins in the Antarctic.

One might suppose that as a group they are on the way to a complete sacrifice of the powers of flight in exchange for a more perfect adaptation to an aquatic environment. Indeed, within the memory of man, one member of the group, the great auk, existed, though it has now become extinct, which had practically assumed the mode of life, and, to a considerable extent, the physical form of the penguins.

Whether the great auk's extinction is to be taken as a condemnation by Nature of that particular form of bird life in Arctic regions, that has proved almost the only successful one in the Antarctic, is a question that leads to rather interesting speculation.

When one takes into consideration the fact that there is so much more land in Arctic than in Antarctic regions, the latter being one is inclined to the view that the retention of the powers of flight is essential to the survival of a species in the former, the reverse holding good in the latter. Where breeding grounds are adjacent to, or, as is frequently the case in the Arctic, actually part of, extensive land-masses, attack from terrestial forms of rapacious animals is much more likely to occur, so that preservation by flight becomes a necessity. Add to the wild-beasts the intelligent hunting of man, and it will at once be seen how poor a chance such birds as the penguins would stand in Arctic regions.

We may come to the conclusion, then, that if the *Alcidæ* are sacrificing the powers of flight, they are doomed to share the fate of their great, flightless relative, the great auk, namely extinction.

425. Pacific Guillemot.

Uria troile californica (Bryant).

Catarractes californicus, Bryant, Proc. Bost. Soc., VIII, p. 142, figs. 3 and 5, 1861.

This, the Pacific representative of the common guillemot or murre, occurs, according to Clark, abundantly in the North Pacific. Snow recorded it as *U. troile* as inhabiting the Kuril Islands. Buturlin records it in his "Birds of Ussuriland," while it is common in the sea at the mouth of the Amur.

The head and neck of this species are dark brown, the upper parts sooty brown, with a white patch on the wing (tips of the secondaries). The lower parts are white, the sides being streaked with blackish. In winter the throat is white, washed with sooty. The bird is slightly larger than *Uria troile*, which is an Atlantic species, and from which it may be distinguished by this feature. Length, 16½ to 17 inches.

426. Pallas' Guillemot.

Uria lomvia arra (Pallas).

Cepphus arra, Pallas, Zoogr. Rosso-Asiatica, II, p. 347, 1881.

This species may be recognized by its large size, it being the largest of the guillemots. It also has the nape and back of the head black instead of brown, the rest of the plumage being the same as

in the foregoing. Its bill is heavier, deeper, and shorter than in *U. troile*, or *U. t. californica*. Its length is from 17½ to 18 inches. It differs from true *U. lomvia* of the Atlantic only in being larger. Buturlin records it from the Ussuri; while Stejneger gives it in his list of Kuril birds. Snow recorded what was probably this bird under the name *Uria brünnichi* as occurring in the Kuril Islands, where it breeds. It commences to lay about June 8th, the single egg being deposited on some bare ledge of rock on a cliff-face.

427. Snow's Pigeon Guillmeot.

Cepphus snowi, Stejneger.

Cepphus snowi, Stejneger, The Auk, XIV, p. 201, 1897.

This bird, which was named after Captain Snow, who recorded it as occurring in the Kurils in great numbers as *Uria columba* (Pallas),* may be distinguished from the latter, to which it is closely related, by the absence or suppression of the white speculum on the wing.

It has the upper parts black, washed with grey, the head and neck brown, the wings entirely or almost entirely black, the under wing surface grey. The bill is black, legs and feet red. Length, 14½ inches.

Snow says that it breeds in the Kurils, laying "one speckled egg under rocks and boulders on the beaches about the middle of June." Clark records it as common in the Kurils as far south as Yezo, and judging from the actions of the birds he saw in Simushir, concluded that they were breeding there, though he was unable to verify this.

Stejneger says that it occupies the Middle Kurils in countless thousands.

428. Sooty Guillemot.

Pseuduria carbo (Pallas).

Cepphus carbo, Pallas, Zoogr. Ross.-Asiat., II, 350, 1811.

This guillemot has the plumage of the upper parts black, the head brown, with a white streak behind the eye. The under parts are white, there being no white on the wing. Length, about 13 inches.

* *Cepphus columba*, Pallas, Zoogr. Ross.-Asiat., II, p. 348, 1811.

The bird has been recorded by Snow in the Kurils, by Giglioli and Salvadori from Olga Bay on the South-eastern Manchurian Coast, by Buturlin from the Ussuri, by Schrench from the Amur, and by Clark as having been seen off Saghalin Island. Thus it would appear to be fairly common in these regions.

429. Short-billed Guillemot.

Synthliborhamphus antiquus, (Gmelin.)

Alca antiqua, Gmelin, Syst. Nat., I, p. 554, 1788.

Recorded by Clark as occurring in the Kurils as far south as Simushir, this species differs from *Pseuduria carbo* in having a very much shorter bill. The upper parts are dark, the head and throat black, with a broad white stripe behind the eye, the breast and lower parts being white. In winter the throat is white, and there is no white stripe behind the eye. Length, 10½ inches.

Snow states that this bird is found "all along the Kurils, always seen in small flocks of eight or nine." Buturlin records it from Ussuri land, and Schrenck from the Amur region.

In addition to the occurrence of this species, it should be mentioned the Jouy's collection contains specimens of short-billed guillemots from Fusan, Corea, on April 20th which have been referred to Temminck's *S. wumizusume*.

430. Partridge Guillemot.

Brachyrhamphus perdix (Pallas.)

Cepphus perdix, Pallas, Zoogr. Ross.-Asiat., II, p. 351, pl. LXXX, 1811.

This little guillemot was collected by Snow in the Kurils, and has since been recorded by Buturlin as occurring in Ussuriland.

It is black on the upper parts, barred and mottled with dull tawny buff. The chin, cheeks, and throat are white, with a white ring round the eye. The lower parts are white, mottled with smoky brown. The bill is longish, though shorter than in *B. marmoratus*, and somewhat compressed. Length, 10 inches.

431. Tufted Puffin.

Lunda cirrhata (Pallas.)

Alca cirrhata, Pallas, Spicil. Zool., pt. V, p. 7, 1780.

This bird, which is also known as the whiskered puffin, is very abundant in the waters round the mouth of the Amur, round Saghalin and along the Kuril Islands, where it breeds on the rocky cliffs

that are so prevalent in these parts. In 1906, when the "Albatross" was cruizing in the North Pacific, it was seen in great numbers, subsequently being reported upon by Mr. A. H. Clark of that expedition. According to him the nest is made at the end of a burrow in some cliff close to the sea shore. The burrows are deep and somewhat large for the bird. Captain Snow, who found this bird very plentiful on the Kurils in summer says that it begins to arrive at the islands about the first week in May, commencing to lay about June 15th. It lays one egg, which is white with very faint markings, the nest being made in holes burrowed out of the soft ground on the tops of cliffs and islets. It leaves soon after the middle of September.

Buturlin and Schrenck also both record this species.

This puffin differs from the common species in having a pair of long tufts or plumes of a straw yellow and white extending from behind the eye, and in having only the upper mandible of the deep, narrow bill grooved. The white of the chin, face, and checks extends along either side of the tufts. The upper parts of the body are of a blackish-brown or sooty, the breast and belly being brownish. The bill is brilliantly coloured, yellow at the base and red at the end. The legs and feet are orange red. Length, 16 inches.

432. Horned Puffin.

Fratercula corniculata (Naumann)

Mormon corniculata, Naumann, Isis, 1821, p. 782.

The horned puffin also occurs in the Kuril Islands, and probably in Saghalin and along the Primorsk Coast. It was recorded by Snow, who states that it is nowhere numerous, though not uncommon on the central and northern islands. The egg is like that of the tufted puffin, and, presumably, the nesting site also.

The bird is characterized by the presence of a horny protuberance on the upper eyelid. The plumage is dark, slaty-black above, and white below, the cheeks and chin also being white, the crown light grey. The throat and neck are black in winter, white in summer. The bill is yellow at the base, red at the end; the legs and feet orange-red. Length, 16 inches.

433. Whiskered Auklet.

Æthia pygmæa (Gmelin.)

Alca pygmæa, Gmelin, Syst. Nat., I, p. 555, 1788.

This is one of the smallest of the auks. It is given by Clark as inhabiting the Kurils, while Stejneger also recorded it from these islands under the generic name of *Simorhynchus*. Snow recorded it under the name *Phaleris mystacea*, as arriving in the Kurils about the end of April, and occurring thereafter in large numbers on Urup.

It lays one white egg under the shelter of a boulder, in coarse shingle, or in a rock-, or cliff-crevice a little way above high-water line. The laying commences about the middle of June.

The whiskered auklet has the upper parts, including the head and throat, blackish-brown, the lower parts being white. It has a long, slender, recurved crest from the forehead, and long white tufts from the sides of the face before the eye, and others from the ear-coverts. These, however, are only present in the breeding plumage. The bill is orange, tipped with yellow. The length of this little bird is only 7½ inches.

434. Crested Auklet.

Æthia cristatella (Pallas)

Alca cristatella, Pallas, Spicelegia Zoologica, pt. V, p. 18, 1769.

This interesting little auklet, which, however, is considerably larger than the foregoing, may be recognized at once during the breeding season by its peculiar crest or tuft of feathers. This rises from the forehead and curves forward over the bill. A pair of white tufts extend backward from behind the eye. The plumage of the upper parts, including the head and neck, are soot-black, the throat and lower parts being greyish. The bill has a peculiar modified shape, being short and notched, and of a red colour. Length, 10 inches.

Recorded by Schrenck under the name of *Phaleris cristatella*, this species was subsequently recorded also by Snow and Clark as occurring along the Kuril Islands, the former stating that it appears with the whiskered auk towards the end of April, the

latter stating that it was seen as far south as Yezo. It lays one pure white egg, choosing the same sort of nesting site as the whiskered auk. The laying commences about the middle of June.

435. Parrot Auklet.

Æthia psittacula (Pallas).

Alca psittacula, Pallas, Spicil. Zool., pt. V, p. 13, pls. II and V, 1769.

Clark records this auklet as being seen in the vicinity of Saghalin and the Kurils, while Stejneger gives it in his list of Kuril birds under the generic name of *Cyclorrhynchus*.

Its chief distinguishing feature is its bill, which is of a red colour, is large and heavy, and has an upward tendency, giving it a peculiar appearance. It is further distinguished by the absence of any crest, though there is a long, curled tuft or plume of white passing backward and downward from behind the eye. The head, neck, and upper parts are dark brownish-black, the throat greyish, and the lower parts white. Length, 10 inches.

436. Knob-billed Auklet.

Æthia pusilla (Pallas)

Uria pusilla, Pallas, Zoogr. Ross.-As., II, p. 373, pl. XC, 1811.

The knob-billed auklet, which is actually the smallest member of the family, may be distinguished by its having in summer a knob at the base of the bill, which disappears in winter. Its plumage is blackish above, white marked with sooty below, chin sooty, throat white. There is a small white tuft above the base of the bill, and another even smaller behind the eye. Length 6½ inches.

Snow mentions it as occurring in the Kurils, but expresses the fear that he confused it with *A. mystacea* (meaning *A. pygmæa*). Clark seems to incline to the belief that the species belongs more to the Aleutian Islands, its place being taken in the Kurils by the pygmy auk (i.e., *A. pygmæa*); this in spite of Stejneger having included it under the generic name *Simorhynchus* in his list of Kuril birds.

Family Laridæ (Gulls and Terns).

Though the gulls and more especially the terns are addicted to visiting, and often breeding on, inland waters at considerable distances from the sea coast, they undoubtedly come under our heading of marine birds. Most, if not all, of them take to the sea at some time of the year, while the majority are to be found either well out at sea or along the coast-line. There is no necessity for a detailed description of this group of birds, for, as a group they are well known even to the most unenlightened. It might be as well to point out that the terns differ from the gulls in having forked tails, longer and more slender wings, usually more slender and pointed bills, smaller legs and feet, and generally smaller and more delicate bodies. As already suggested they frequent inland waters to a much greater extent than do the gulls, where, also, they breed to a considerably greater extent.

This group of birds is fairly well represented in the Manchurian Region, our list containing thirteen gulls and six terns. It is probable that this list is still incomplete.

437. Glaucus Gull.

Larus glaucus, Brünnich.

Larus glaucus, Brünnich, Orn. Bor. p. 44, 1764.

One of the most beautiful of the gulls is the well-known glaucus gull, so called on account of its general light colouring, the whole plumage being pure white excepting the wings and back which are tinted or lightly washed with light pearl-grey. It also has shorter wings and smaller feet than is usual with the gulls. The bill is pale yellowish with a red spot towards the end of the lower mandible, the legs and feet being yellow. It is a large bird, measuring from 28 to 30 inches.

It has a circumpolar distribution in summer, migrating southward in winter. Snow, who calls it the burgomaster gull, records it as common in the Kurils, where it breeds. It lays as early as the last week in May, and during the breeding season, according to this observer, it preys upon the little auks that abound.

Dresser records it as breeding on the south coast of Taimyr Island. Three eggs are laid.

Buturlin also gives it in his "Birds of Ussuriland."

There seems to be some question as to whether this species should not be known under the name *Larus hyperboreus*, of Gunnerus, which is a pre-Linnean name, antidating even Brünnich's commonly accepted one. For the present, however, I prefer to let *L. glaucus* stand, though fully aware of the fact that if Brünnich's name is admissable at all in modern nomenclature, then that of Gunnerus is more so.

438. Glaucus-winged Gull.

Larus glaucescens, Naumann.

Larus glaucescens, Naumann, Naturg. Vog.-Dentsch., X p. 351, 1840.

The glaucus-winged gull differs from the foregoing species in having faint grey mottlings on the wings, and in being smaller. The bill is dark horn-coloured, and the legs and feet pink. The rest of the plumage is white. It measures not more than 27 inches in length.

It relpaces to a large extent the glaucus gull in the North Pacific. Though not mentioned by Clark or Snow as occurring in the Kuril or Saghalin regions, it has been recorded from the China seas, and probably occurs off the Primorsk Coast as well as off the South Manchurian Coast, especially as it is known to have a more southerly range than *L. glaucus*.

439. Common Gull.

Larus canus, Brünnich.

Larus canus, Brünnich, Orn. Bor. p. 43, 1764.

This species occurs all along the China and South Manchurian Coasts, where it is common. Snow also records it from the Kurils, as also does Stejneger.

The head, neck, breast, tail, and under parts are white, the back and wing-coverts bluish-grey, the quills black, tipped with white. The bill is greenish at the base and yellow towards the tip, while the legs are greenish-yellow. Length, 18 inches.

440. Eastern Herring Gull.

Larus vegæ, Palmén.

Larus argentatus, var. *vegæ*, Palmén, Vega Exped. Vetensk., V, p. 370, 1887.

This handsome gull may be recognized at once by it large size. The immature bird, as is the case with gulls generally, has a dark, mottled appearance; but the adult has the head, neck, breast, tail,

and under parts white, the back and wings grey, and the flight feathers black, tipped with white. The bill is yellow, the legs and feet pink. Length, 24 inches.

It is very common in the the Pe-chi-li Gulf and along the South Manchurian Coast. Clark records it in the vicinity of Kamschatka, and Buturlin from the Ussuri; while Dresser reports it as nesting on the rocks of the southern shore of Taimyr Island, Northern Siberia.

441. Arctic Herring Gull.

Larus cachinnans, Pallas.

Larus cachinnans, Pallas, Zoogr. Rosso-Asiat., II, p. 318, 1811.

This gull differs from the Eastern herring gull (*L. vegæ*), which it resembles in size in having brilliant yellow legs and feet instead of pink ones, a somewhat lighter mantle, and different white markings on the flight feathers. Length, 24 inches.

Snow records it from the Kurils. and Giglioli and Salvadori mention it as having been taken at Vladivostok. It is known also in the China seas in winter.

442. Siberian River Gull.

Larus affinis, Reinhardt.

Larus affinis Reinhardt, Vidensk. Meddel., 1853, p. 78.

Related to the black-backed gull, this bird inhabits Northern Siberia during summer, where Dresser records it as breeding on Taimyr Island. The nest is constructed of layers of moss, reindeer hair, and feathers of geese, the last with the quills pointing outward, and the whole lined with down, and placed on a stone in the middle of running water. It is thus safe from the attacks of wolves and foxes.

The bird is somewhat smaller than *L. cachinnans*, and has very much darker back and wings. The quills are much as in *L. vegæ*. The legs and feet, as well as the bill, are light yellow. Length, 23 inches.

443. Slaty-backed Gull.

Larus schistisagus, Stejneger.

Larus schistisagus, Stejneger, The Auk, 1884, p. 231.

This large gull is the Pacific representative of the great black-backed gull (*L. marinus*) of the Atlantic, which bird it resembles, except that the back and wings are a little lighter, being of a slaty-grey. The primaries are black, tipped with white. The head, neck, lower parts and tail are white. The bill is yellow, with a red patch towards the tip of the lower mandible; the legs and feet yellowish flesh-colour. Length, 26 inches.

Clark records this gull as "abundant at Simushir and in the Kurils," and also as "common about the eastern shore of Sakhalin the latter part of September." Snow recorded it as *Larus marinus* in the Kurils; while Buturlin gives it in his list of Ussuriland birds. Stejneger, who first described the bird in 1884, and subsequently gave it in his list of birds of the Kuril Islands in 1899, says that it is not a subspecies of *L. marinus*, as maintained by some.

444. Black-tailed Gull.

Larus crassirostris, Vieillot.

Larus crassirostris, Vieillot, Nouv. Dict. Hist. Nat., XXI, p. 508, 1818.

From Clark's account it would seem that this bird is abundant in the seas from Saghalin to Japan and off Corea. Louis Jouy's collection contains a single specimen from Fusan, South-eastern Corea; while Gigloili and Salvadori record it from Olga Bay on the Primorsk Coast.

The species is characterized by having a black bar across the tail, the plumage otherwise being as in most other gulls, grey on the back and wings, and white on the head, neck, under parts and tail. Its bill is unusually deep, from which it gets its name, and is of a greenish-yellow colour, with a blackish band toward the tip, the latter being red.

445. Saunders' Gull.

Larus saundersi, (Swinhoe).

Chroicocephalus saundersi, Swinhoe, Proc. Zool. Soc. Lond., 1871, pp. 273 and 421, pl. 22.

This is a small gull with a pure black head and neck, the lower neck, chest, breast, belly and tail being white, the mantle and wings pearl-grey; while the primaries are white edged with black. The bill is black; legs and feet orange. Length, about 12½ inches.

That it occurs in our region, though apparently rarely, is evidenced by the fact that Taczanowski records it from Ginzan (Gensan) in North-eastern Corea.

446. Laughing Gull.

Larus ridibundus sibiricus, Buturlin.

Larus ridibundus sibiricus, Buturlin, Messag. Ornith., II, 1911, p. 66.

This is undoubtedly the commonest gull to be found either in Manchuria or North China, where it occurs in great numbers on inland stretches of water such as marshes and lakes, at least during both spring and autumn. It is also common along the coasts.

Specimens secured by me in the Tientsin district, and sent to the Smithsonian Institution, Washington, have been referred to Buturlin's subspecies. I therefore use his name, though an examination by me of specimens in the British Museum collection from Chin-wang Tao, Kamschatka, Central Asia, India and Europe reveal no differences, except that the Chin-wang Tao specimen has a distinctly darker, blacker head than the others. This, however, is not the case with the specimens from Kamschatka.

The laughing gull in the adult plumage has the head brownish-black; the breast, lower parts, and tail white; the neck, back and wing-coverts pearl-grey, the primaries white edged and tipped with black. In the fully adult male the breast, in life, frequently has a delicate rose-pink shade, more noticeable if the feathers be parted. This colour soon disappears, however, in the preserved specimens. In the immature bird the head is white, or very light grey, with a dark spot behind the eye, the tips of the tail-feathers also being dark. Length of the fully adult, 16 inches. The bill, legs and feet are of a dull, deep crimson.

Snow records *L. ridibundus* from the Kurils; while Clark records *L. ridibundus brunneicephalus*, Jerdon, at Petropaulski in Kamschatka.

447. Kittiwake.

Rissa tridactyla, (L.)

Larus tridactylus, L. Syst. Nat., I, p. 224, 1766.

There appears to be some doubt as to which of the species or subspecies of *Rissa tridactyla*, the common kittiwake, occurs in the Manchurian coastal regions of the North Pacific. Clark uses the name *R. tridactyla pollicaris*, Ridgway,* which is that for the common kittiwake of the Pacific Coast of North America, to designate the birds of the Kuril Islands. In an examination of specimens in the British Museum from these parts and Europe, I fail to discover any differences whereby they may be separated, and so prefer to use the old Linnæan name.

The kittiwakes differ from the gulls in general in the shortness of their legs and the total absence, or, if it is present as in some individuals, the extreme smallness of the hind toe. Our form has the head, breast, tail, and under parts white, the back and wings deep pearl-grey, and the primaries paler pearl-grey, tipped with black. The bill is greenish-yellow, the legs, black or brown. Length about 16 inches.

Snow records this species as being plentiful in the Kuril Islands, commencing to lay about June 10th. The nest is placed on a ledge on the face of some cliff. Three eggs are laid.

The bird has also been recorded by Dresser as nesting on Bennett Island on the North Siberian Coast.

Another species of kittiwake occurs in the North Pacific, namely *Rissa brevirostris* (Bruch),† but Clark states that it was not met with from Kamschatka to the Kurils. This bird is characterized by red legs, darker upper parts, and a shorter bill, the latter being rich yellow instead of pale greenish-yellow or horn coloured. It is known to occur in the Bering Sea, and is apparently a more purely boreal species than *tridactyla*.

*"Water Birds of North America," by Baird, Brewer, and Ridgeway, II, 1884, p. 202.

† *Larus brevirostris*, Bruch, Journ. F. Orn., 1853, p. 103.

448. Sabine's Fork-tailed Gull.

Xema sabinii (Jos. Sabine.)

Larus sabinii, Jos. Sabine, Trans. Liun. Soc. London, XII, p. 520, 1819.

Sabine's gull is distinguishable from all of the foregoing by its forked tail. In the breeding plumage it has the head and upper neck lead-grey with a black ring round the neck, separating the lead-grey of the upper neck from the white of the lower neck. The breast, lower parts, and tail also are white; back and wings are grey; the primaries black, tipped white. The bill is black tipped with yellow, the legs and feet blackish.

This species breeds in Siberia, as well as along the northern coasts of North America. In winter it travels south-ward, and probably occurs off the Manchurian Coasts, though there are no records of this.

449. Chinese Lesser Tern.

Sterna sinensis, Gmelin.

Sterna sinensis, Gmelin, Syst. Nat., I, p. 608, 1788.

This is one of the commonest of the terns that occur along the shores of the Pe-chi-li Gulf and along the South Manchurian Coast. It follows up the estuaries of the rivers, and enters the marshes that occur a little way inland. It does not travel far inland, however, except along the largest rivers such as the Amur and Sungari. I saw a few specimens on the lower reaches of the latter river in August, 1915. Its favourite nesting haunts are sandy flats along the sea shore.

The smallest of the eastern terns, it is a beautiful and graceful little bird. The back of the crown and nape are black, with a black line through the eye. The forehead, eyebrow, cheeks, throat, neck, breast, lower parts, and tail are white. The back and wings are light grey. The bill is black and yellow; the legs and feet yellow. Length, about 8 inches.

Buturlin records the species from the Ussuri region; while Jouy secured a specimen from the Salu River at Seoul in Corea on June 25th.

450. Swift Tern.

Sterna bergii, Lichtenstein.

Sterna bergii, Lichtenstein, Verz. Doubl. Zool. Mus. Berlin, p. 80, 1823.

This is rather a large tern, which may be readily recognized by its large horn-coloured bill, and the presence of a black crest at the back of the head. The forehead, throat, cheeks, neck, and lower parts are white, the back, wings and tail being grey. Bill and legs black; length about 17 inches.

I include this species in our list as its range is known to extend up to the Japanese Sea from more tropical regions, though it is possible that it is represented in these parts by some subspecies.

451. Long-winged Tern.

Sterna longipennis, Nordmann.

Sterna longipennis, Nordmann, Erman's Verz. von Thieren und Pflanzen, p. 17, 1835.

I secured a specimen of this gull in the swamps adjoining the Sungari River near its junction with the Amur, where it was very plentiful. It probably breeds in this area for my specimen was secured on August 7th. The species is recorded by Snow as being common in the Kurils in spring. Buturlin and Schrenck also record it.

This graceful bird has the cap black; mantle and wings pearl grey; the rest of the plumage white. The bill and legs are black, the bird measuring 14 inches in length.

It may be distinguished from the common tern by its longer wings, and white under parts.

452. Common Tern.

Sterna fluviatilis, Naumann.

Sterna fluviatilis, Naumann, Isis, 1819, pp. 1847, and 1848.

This is the common tern of China and neighbouring countries, including Manchuria. In it the cap and nape are black, the upper parts, including the wings, pearl-grey; the throat, cheeks, under parts and tail white, more or less heavily washed with vinous pearl-grey on the neck and lower parts. The bill is orange-red with a black tip; the legs and feet crimson-red. Length, 14½ inches.

It occurs all over Manchuria, wherever there is open water during the spring, summer, and autumn, and only betakes itself southward when the frosts of winter set in.

Saunders described a form from Thibet and Lake Baikal under the name *Sterna tibetana*,* and it has been supposed by some that the eastern birds belonged to this species. It was said to differ in having the sides of the neck, shoulders, and flanks of a clear grey, which assumes a more vinous tint on the breast and abdomen; the mantle and wings also being darker. I examined a series of specimens in the British Museum from Thibet, the Baikal region, Eastern Asia, and Europe, and though some of the Thibetan and Baikal specimens certainly showed the above characteristics, the same could be found amongst British specimens, nor was it possible to separate these dark specimens from the two regions from each other.

453. Caspian Tern.

Hydroprogne caspia (Pallas)

Sterna caspia, Pallas, Nov. Comm. Petrop., XIV, 1, p. 582, Tab. XXII, fig. 2, 1770.

Though this large tern has not been recorded by any of the authorities quoted hitherto, it is fairly common in North-eastern Chihli. Not only have I secured a specimen in the Tientsin district, but I have on several occasion seen others there, while my friend the Rev. G. D. Wilder has secured a specimen in the Tungchow district, east of Peking. Thus it probably occurs also in South Manchuria, at least, if not further to the north and east in that country.

The Caspian tern is by far the largest tern in these regions, measuring some 21 inches in length. It has a black crown and crest, the latter short; the upper parts being pearl-grey, the lower parts white. The primaries are black. The bill, which is long and thick, is bright crimson-red; the legs and feet, which are peculiarly short and small for so large a bird, are black.

454. White-winged Black Tern.

Hydrochelidon leucoptera grisea (Horsfield.)

Sterna grisea. Horsfield, Trans. Linn. Soc. Lond., XIII, 1, p. 199, 1821.

This species is very common in the summer in North China and Manchuria, where it may be seen in great numbers along rivers

* Proc. Zool. Soc. Lond., 1876, p. 649.

and in marshes, as well as along the sea-shore. I found it very common along the Lower Sungari River. Schrenck records it from the Amur region, and La Touche at Newchwang and on the Liao River.

It may at once be recognized by its black head, neck, back, breast, and belly, its grey or whitish wings, and white tail. Its bill is black; legs and feet yellow. Length, 9½ inches.

455. Whiskered Tern.

Hydrochelidon hybrida (Pallas.)

Sterna hybrida, Pallas, Zoogr. Ross.-As., II, p. 338, 1811.

In this species the crown is black, the upper parts dark grey, the wings, rump and tail grey, the chin and sides of the head white, the throat and breast grey merging into blackish-grey on the belly. The bill is crimson-red; the legs and feet brownish. Length, 11 inches.

The species is common in summer all along the great rivers and in the marshes of Manchuria, as well as along the sea-shore. I saw it along the Sungari, where on the lower reaches of that river it occurred in large flocks. The species evidently breeds in these regions. La Touche records seeing specimens between Chinwang Tao and Pei-tai Ho in the summer.

Family Stercorariidæ (Skuas, or Jaegers).

The skuas, or jaegers, as they are sometimes called, as a group are interesting birds, in as much as they are the highway robbers of the sea. They obtain their living by attacking and robbing such birds as gulls of their hard won prey, for which purpose they are armed with sharply hooked bills.

All three of the northern forms, belonging to the genus *Stercorarius*, occur in our region, but as there exists considerable confusion as regards the names of two of them, it is not always clear exactly which species was meant by their recorders. Thus Snow records *S. buffoni*, *S. richardsoni*, and *S. pomatorhinus*, as occurring along the Kuril Islands; while Clark records in the North

Pacific the long-tailed skua under the name *S. longicaudus*, Vieillot, and the pomarine skua *S. pomarinus*, Temminck, and off the Kurils Buffon's skua as *S. parasiticus*, L. Buturlin records *S. crepidatus*, Gm., *S. parasiticus*, L., and *S. pomarinus*, Temm. from the Ussuriland. The confusion seems to arise over the question as to whether Vieillot's name *longicaudus* was meant to apply to the skua with the longest tail or not. The concensus of opinion, nowadays, is that Brünnich's name *parasiticus*, which antidates the 12th edition of Linnæus' Systema Naturæ by two years, is available for the so-called Buffon's skua, which leaves *longicaudus* available for Richardson's or the long-tailed skua, and makes Banks' *crepidatus* a synonym for *parasiticus*. As regards the pomarine skua there has never been much confusion.

Thus we may take the commonly accepted names for the three species in question as:

1. The pomarine skua, *Stercorarius pomarinus* (Temminck).
2. Buffon's skua, *Stercorarius parasiticus* (Brünnich).
3. Richardson's skua, *Stercorarius longicaudus*, Vieillot.

456. Pomarine Skua.

Stercorarius pomarinus (Temminck).

Lestris pomarina, Temminck, Man. d'Orn., p. 514, 1815.

Stercorarius pomatorhinus, Brisson, Orn. VI, p. 152, pl. XIII, fig. 2, 1760, and Sclater, Ibis, 1862, p. 297.

This bird is the largest of the three skuas recorded from these regions, and on account of its distinctive appearance should admit of no doubt in the recorder's mind. Thus we may take Snow's record of it in the Kurils, and Buturlin's from Ussuriland as being correct. Clark also records it from the North Pacific.

In this species, as indeed with the other two as well, there are two colour phases, a so-called light phase and a dark one. In the light phase of the fully adult bird the cap is black, the face, head, back of the neck, back, wings, and tail are dark dusky-brown, or slate-brown; while the throat, cheeks, foreneck, breast, and lower parts are white, with a distinct tinge of straw yellow. In some cases the white may continue almost or entirely round the neck.

The tail is rather long, the two central feathers extending some four inches beyond the others, and being characterized by being broad and twisted upward at their sides. In the dark phase the whole bird is dark brown, a little lighter below than above. The bill is large and strong and black in colour; the legs and feet blackish. The length of this bird is 21 inches. Length of wing, over 14 inches.

457. Buffon's Skua.

Stercorarius parasiticus (Brünnich).

Catharacta parasitica, Brünnich, Orn. Bor., p. 37, 1764.
Larus parasiticus, L. Syst. Nat., I, p. 226, 1766.
Larus crepidatus, Banks, in Cook's Voyage, Hawkesworth's edition II, p. 15, 1773.

Recorded by Snow as *S. buffoni* from the Kurils and by Buturlin as *S. crepidatus* from Ussuriland, this skua seems to be fairly common in these regions.

In both the light and dark phases this species resembles the foregoing, except that the complete white neck is always present in the adult in the light phase. It may be distinguished, however, by its smaller size, and the fact that the central tail feathers do not bend up at all, are narrower, and more pointed. They extend beyond the others not more than three inches. The total length of this bird is 17 inches; the wing under 14 inches.

458. Richardson's Skua.

Stercorarius longicaudus, Vieillot.

Stercorarius longicaudus, Vieillot, Nouv. Dict. Hist. Nat., XXXII, p. 157, 1819.
Stercorarius richardsoni, Swainson, Faun. Bor.-Am., p. 433, 1831.

Clark records the above species of skua as occurring off the Kuril Islands. He reports seeing but one specimen in these parts, though it was common enough in the Bering Sea. Snow records it as *S. richardsoni* also from the Kurils, while Buturlin gives it as *S. parasiticus* from Ussuriland.

This is the smallest of the three skuas, and is further distinguishable by its very much longer central tail feathers, which are twelve inches in length, and extend beyond the others by about eight inches. The plumage is like that of the two foregoing, but is more contrasted and intense, the white of the back of the neck being broader, while there is none of the cloudiness on the chest which is liable to occur in the others. Only the two outer primaries have white shafts, while in the other two species all are so coloured. The bill is shorter, though proportionately deeper than in *S. parasiticus*, and, of course, much smaller than in *S. pomarinus*. The total length of this bird, including the elongated tail feathers is 21 inches.

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